Scientific American

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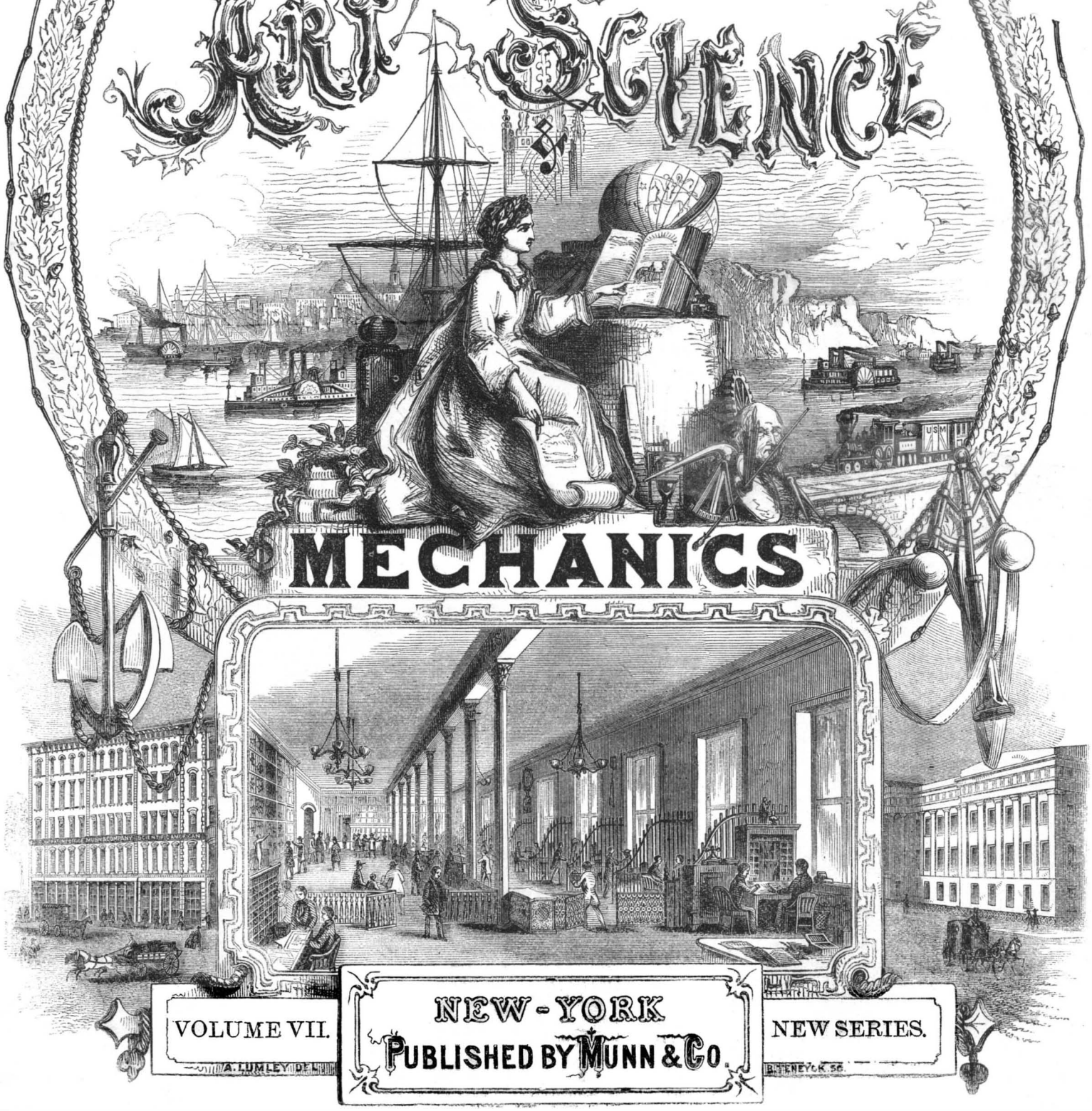
JOURNAL

OF

ART & SCIENCE

MECHANICS



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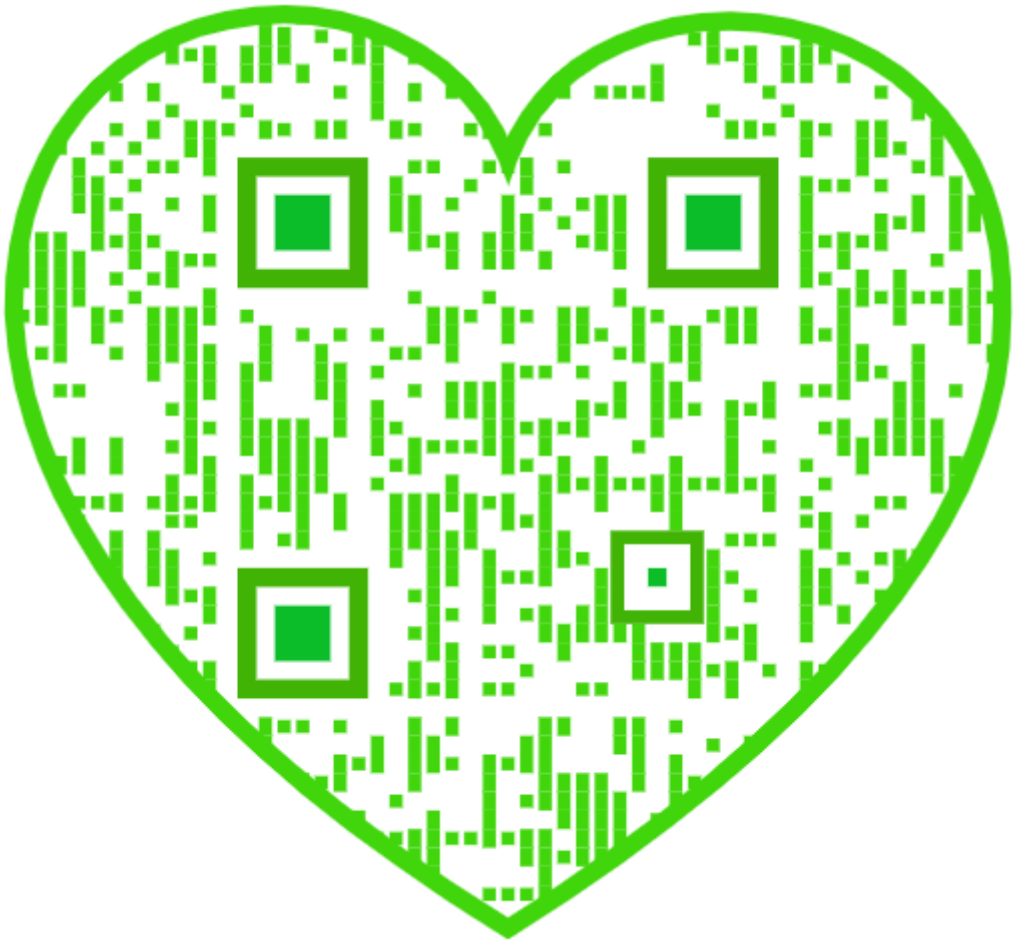


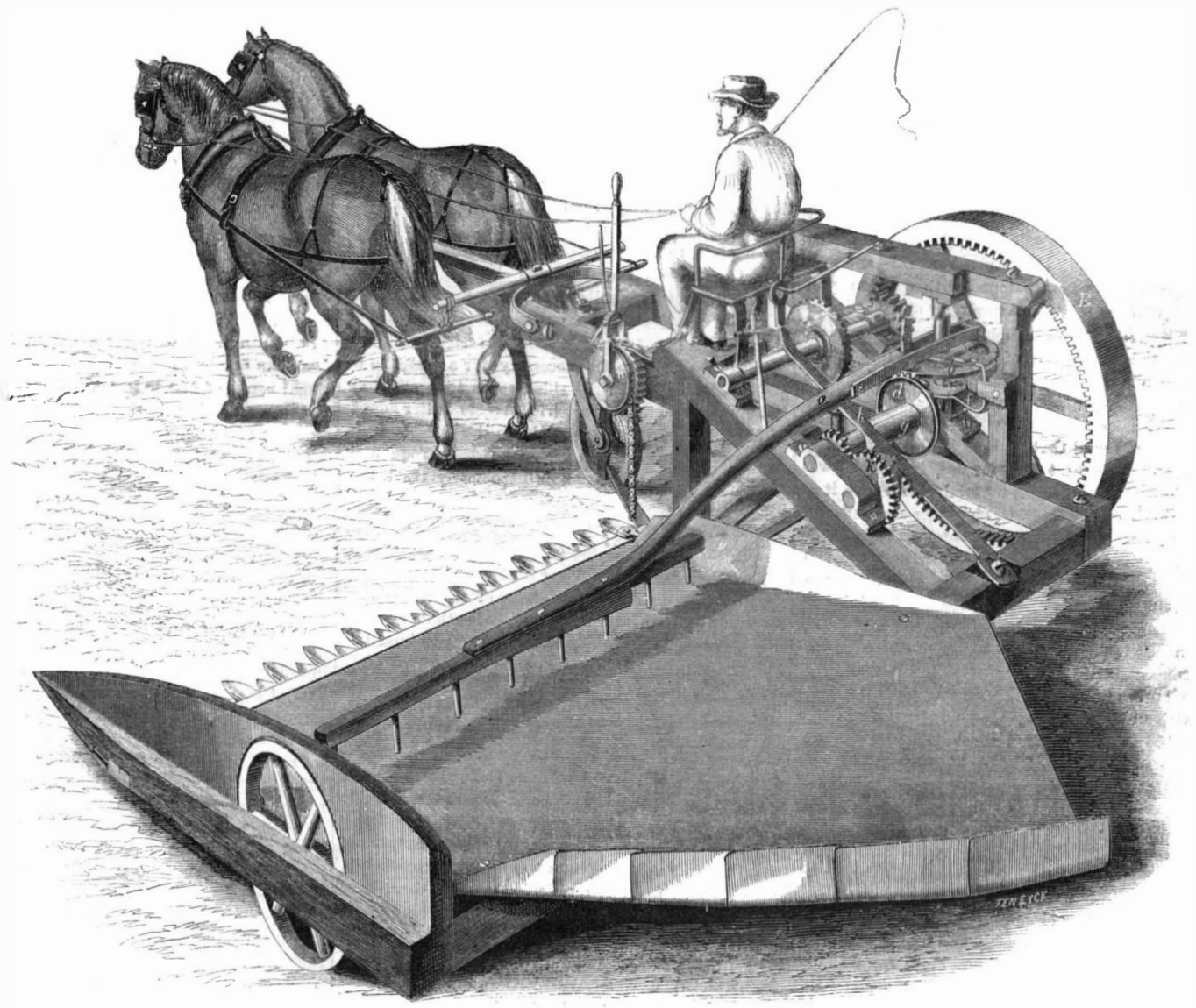
Scientific American.

A WEEKLY JOURNAL OF PRACTICAL INFORMATION IN ART, SCIENCE, MECHANICS, CHEMISTRY AND MANUFACTURES

VOL. VII.---NO. 1. NEW YORK, JULY 5, 1862. NEW SERIES.

Automatic Rake for Harvesters.

For a long time after the reaping machine was invented, the bundle of grain when it accumulated upon the platform was removed by hand; the application of a self-operating rake having baffled the skill of the ingenious mechanicians who invented the cutting portion of the machine. But when the attention of the great body of inventors was called to the subject, designs for accomplishing the purpose began to come forth by the dozen. We recently illustrated one of the most ingenious of these, and we now present an engraving of another. In this the rake has no more than the requisite movement, sweeping across the platform in a horizontal plane, and then rising and returning over the grain: the motions being all effected by simple devices. The engraving shows all of the parts very plainly.



TWINING'S AUTOMATIC RAKE FOR REAPING MACHINES.

The rake shaft, *a*, is attached at its upper end by a hinge to one side of the wheel, *b*; an upright stud, *c*, being secured rigidly to the opposite side of the wheel, and rising through a slot in the rake shaft, thus allowing the rake to rise and fall, while its horizontal motions are controlled by those of the wheel. The wheel, *b*, has a beveled gear segment upon its edge, meshing into a similar segment on the vertical wheel, *d*, the wheel, *d*, being firmly keyed upon the shaft of the driving or ground wheel, *e*. Exactly opposite to the segment mentioned, upon the wheel, *c*, is a similar segment meshing into a corresponding segment on a second wheel (not shown in the engraving), which is also keyed upon the shaft of the driving wheel. It will be seen that as the shaft of the driving wheel revolves, the rake is swept backward over the platform by one segment of the wheel, *c*, and carried forward to its place by the other.

As the rake begins to move forward from its position at the rear end of the machine, it is raised to pass over the grain upon the platform. To effect this motion a cam is secured to the shaft of the driving wheel near the upright shaft of the wheel, *b*, and acts upon the rake shaft through the medium of a U-shaped plate of metal, *f*. This plate embraces loosely the wheel, *b*, the shaft of which passes freely through holes in the end of the plate; thus allowing the plate sufficient vertical motion to raise the rake over the grain during its movement from the back to the forward end of the platform.

The several parts described are made of proper proportions to remove the grain as often as it accumulates in bundles of suitable size for binding when reaping large or medium crops, but in reaping very light crops the grain requires to be removed less frequently from the platform, and a simple device is readily adjusted to give the rake only one half the number of motions in a given time. To effect this the wheel, *d*, is secured to a hollow shaft which fits loosely upon the shaft of the driving wheel so that it may slide along this shaft; the rotation being imparted by a groove and feather. The engraving represents the wheel as held in place by the lever, *h*, which presses against the end of the hollow shaft, *g*; but when the operator encounters very light grain, he presses the hook, *i*, out from its hold upon the end of the lever, *h*, when a spiral spring, coiled around the shaft of the driving wheel, forces the

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wheel, *d*, along the shaft toward the left where it cannot engage with the geared segment upon the wheel, *b*. In this position of the parts the rake will remain without motion in relation to the machine until the wheel, *d*, is carried back where it may again operate upon the wheel, *b*. This return of the wheel, *d*, to its place is effected by a cam, j, upon the side of the wheel, *k*. The wheel, *k*, meshes with a pinion of half the number of teeth, which is fixed upon the shaft of the driving wheel, thus carrying the wheel, *d*, to its place and effecting the motion of the rake at each alternate revolution of the driving wheel.

The other parts of the machine being of ordinary construction, require no description in this place. A reel is employed as usual, but it is omitted from the drawings for the purpose of showing all the parts of the raking device more clearly.

The patent for this invention was granted, through the Scientific American Patent Agency, August 14, 1860, and further information in relation to it may be obtained by addressing the inventor, Isaac C. Twining, at Wrightstown, Penn.

ARMSTRONG GUNS AND IRON-CLAD SHIPS AGAIN —IRONSIDES INVULNERABLE.

We have already devoted considerable attention to the varied phases which the celebrated Armstrong gun has assumed since its first introduction into public life, some three years ago. We now learn from more recent intelligence that it has made another appearance in the British Parliament, this time, however, in a very questionable character, if we may believe the statements which some right honorable member made concerning it.

When this gun came forth from the fertile brain of plain William Armstrong, it was assumed that with it the army and navy of Old England were safe against the combined assaults of all the world—and even lately Uncle Sam was threatened with condign punishment with the terrible Armstrong and the invulnerable ironsides of the British navy The conceited views of the supporters of this terrible gun were toned down a little by information received from China, some two years ago, where it had been tried in actual service.

It was there found that its breech piece was defective; it leaked, became unfit for use, in short it was reported a failure. In various trials made with it at Woolwich and other places, its character also suffered, and it was supposed to be laid aside as a relic of the past. These contradictory statements and opinions were derived entirely from British publications.—They afforded evidence of the difficulty of arriving at the real truth respecting the experiments made with the gun. It is but a few weeks since we were informed, through British sources, that the new, 10-inch, smooth-bore, muzzle loading, Armstrong coiled gun, had, with a charge of fifty pounds of powder and a shot of 156 pounds, pierced through a target representing a section of the frigate *Warrior*, as easily almost as if it had been a pine board. As this target had previously resisted salvos from several 68-pounders and large Armstrong rifle guns, it was given out that the strongest iron-clad ships were of no avail against the new guns. The character of the muzzle-loading, smooth-bored Armstrong at once arose to a high pitch in public esteem, while that of iron-clad ships went down in the same ratio. It was then very generally asserted that iron-clad ships could not be built capable of resisting the new artillery that could be brought to bear against them. But as a counterpoise to such statements and opinions, we find the wonderful penetrating achievements accredited to this Armstrong gun contradicted, by news received quite recently.

Mr. Osborne asserted in Parliament, that the statements which had gone forth to the public respecting the new gun having pierced and destroyed the *Warrior* target with its shot, were untrue. When this target was examined it was found that the 156-pound shot discharged at it with 50 pounds of powder, had not pierced the inner skin plate, but had stuck fast in the teak backing. He stated that after three million pounds sterling had been expended in the manufacture and purchase of Armstrong guns, they were inferior to the old 68-pounders, and were a failure. In reply to such statements, Sir J. Hay admitted that the target of the *Warrior*, said to have been pierced through and through with this gun, remained without being completely penetrated, still, this new, smooth-bore, 10-inch Armstrong exhibited the greatest penetrating power of any gun yet tried. It had been once fired with 90 pounds of powder, and since then, several times with 50 pounds, and it did not appear to be a failure. Sir J. Hay asserted that the experiments with the target only afforded proof that the *Warrior* was sufficiently strong to resist the effects of very heavy projectiles, and that at 200 yards distance she could not be penetrated by any of the guns fired at the target. The London *Mechanics' Magazine*, of May 23d, confirms this statement. It says: "It must be admitted that up to this time, the *Warrior* section has stood the brunt of the heaviest ordnance used in these target trials, with the least damaging effect."

As we are now building several iron-clad vessels for the American navy, and as it involves a very heavy expense to make experiments in firing at iron plates, those which have been made by the British government are of great value to us, as affording information of a practical character. Some new experiments were tried at Shoeburyness, England, on the 20th ulto., with a target made of iron plates, five inches thick, lined with a skin or inner plate one inch in thickness, and a web of india rubber ⅜th-inch thick, placed between the two. The target was supported with longitudinal iron ribs 2½ inches thick. Shells were discharged from 68-pounders with charges of 16 pounds of powder, but they were broken in pieces. Solid 140-pounder and 68-pounder shot were then fired with 16 and 20 pounds of powder, and these broke several rivets and split the iron ribs. The famous 150-pounder smooth-bore Armstrong gun, with a charge of 50 pounds powder, was then fired, when it penetrated through the five-inch plates, making a hole as big as a man's head, and carrying away the inner plate to a distance of thirty yards behind the target. The old target of the *Warrior* being still standing, another similar shot was fired at it, but while it penetrated the outer plate it did not go through the inner one. In order to resist heavy projectiles it seems to be necessary for a vessel to be built with thick and rigid sides, so as to prevent vibration. No material, yet tried, seems better adapted for this purpose, than tough wood. A backing of india rubber, behind iron plates, has been frequently suggested to us; it has now been fairly tried, and found worthless.

Death of Charles Ellet, Jr.

This distinguished engineer died at Cairo on Saturday, the 21st ult., from the effects of the wounds received by him before Memphis. In that engagement, Colonel Ellet unnecessarily exposed himself in his eagerness to manage his rams and witness their operations, and was twice wounded. Colonel Ellet was a native of Pennsylvania, and was by profession a civil engineer. His name is identified with many of the great works of engineering skill in the mountains of Virginia, Maryland and Pennsylvania. He was also the constructor of the first Suspension Bridge at Niagara Falls. Colonel Ellet had an exceedingly vigorous and active mind, and was the author of many new ideas in reference to public improvements, some of which, though ridiculed at the time, have come to attract notice and respect.

At the outbreak of the war Colonel Ellet became deeply interested in military matters. He projected a plan for overwhelming the rebels at Manassas, which found no favor at the War Department, or with Generals Scott and McClellan. Having failed to carry this plan, he criticized General McClellan in a couple of bitter pamphlets.

Colonel Ellet had been for a long time an ardent advocate of iron-clad vessels and rams. But though stimulated by the *Merrimac* and *Monitor* affair, the Departments of the Navy and of War were not inclined to concede all that the sanguine engineer claimed for his plans. He therefore constructed his iron-bound rams with private capital, with the understanding that if they were a success the Government should purchase them. With these the fight before Memphis was fought, and very successfully. The rams and Colonel Ellet at once came into high favor. Colonel Ellet has died on the very threshold of his military career, and when his well-deserved fame was dearest to him. The command of his flock of rams devolves upon a person of the same name, his son or brother, and the iron-headed vessels will again be heard from if any opponent worthy of their "butts" appear.

An American Iron Brig.

The following is part of a communication from R. B. Forbes, Esq., of Boston, respecting the qualities of an American iron vessel. He says:—

In one of your late numbers you allude to the brig *Nankin*, built of iron in 1858, by Mr. Otis Tufts. My correspondents in Hong Kong, China, wrote under date 31st March last:—

On her passage from Ningpo to this place, coming through the Chusam Group, she ran on an undiscovered rock, going at the rate of about nine knots; she came off in half an hour and proceeded on her voyage, not leaking at all—she has gone to Whampoa to be docked and repaired."

On the 13th April they write further:—

We have now to advise that the bottom of the *Nankin* was found quite uninjured, showing not even a scratch from her collision with the rock of reef.

The *Nankin* is probably the strongest vessel of her class afloat, and reflects great credit on her builder, Mr. Tufts. She was once on the beach at Kanawaga, Japan, during a gale for twenty-four hours, and came off whole, when many wooden vessels broke into splinters.

Sugarcane Trash as a Material for Paper.

Gov. Darling, of Barbadoes, has received a letter from Mr. William M'Farlane, a Glasgow stationer, calling attention to the value of the trash of the sugarcane as a material for paper. The writer states that the fuel value of cane trash of every 100 tuns of sugar, is £1,000; and then makes the following calculations:—For every 2,200 tuns (the produce against 100 tuns of sugar) of sugar-cane trash we might safely reckon on getting 2,000 tuns of finished pulp. Let us see the cost of that in London. Fuel, £1,000; wages of a skilled workman, one year, £200; capital invested, £300 at 10 per cent, £30; loss by wear and tear, £30; freights from Jamaica to London at £3 10s, £7,000; add profit on the whole transaction, £5,700; the price of 2,000 tuns of pulp, £14,000 in London, being equal to £7 per tun, or less than one-half of the price of rags, while an additional bonus of £7 per tun of sugar may be conferred in the West Indies, if they only choose to adopt this economy and help themselves. Mr. M'Farlane also describes the machinery—a very simple affair—by which the cane trash can be reduced to pulp for the home market.

How to Make a Boiled Dish.

Almost every family has a dinner as often as once a week of what is popularly known as a "boiled dish," and which, properly cooked, is one of the best dishes in the world; but all cooks do not know the best way to boil corned beef. The common method, in order to make it tender, is to put it into cold water and let beef and water come gradually to boil. This certainly makes beef tender, but also extracts the strength and juice. A better way is to wait till the water boils before putting in the beef; it will then be sufficiently tender and will retain all its strengthening and juicy properties. Hams, after boiling four or five hours, according to size, should be taken out, the skins taken off, and cracker and bread crumbs grated over them, and then baked in a brisk oven for one hour. A leg of mutton can be treated successfully in the same way, only it does not need to be boiled so long, and of course the boiling process should be gentle.

Sandwich Island Cotton.

The Honolulu *Advertiser* says:—Messrs. Crewer & Co. have set one of their cotton gins at work, and a few bags of our Island cotton were passed through it. Both the Sea Island and common varieties were tried, and the gin turned out an article as clean, soft and downy as the most ardent enthusiast of cotton culture could desire. Such cotton as the sample now before us would bring, probably, under the present inflated prices, not less than 25 cents a pound in London or New York, and would bring, in ordinary times, 12½ cents. Let us have more cotton planted and give the article a fair trial. We now have the machinery to clean and pack it in as good order as that produced in any other country. Let us have a sample of one thousand bales or so raised by the close of this year. There need be no fear of any want of buyers when such clean and white cotton can be produced.

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THE LONDON EXHIBITION.

The following are some further extracts from the London *Mechanics' Magazine* :—

THE AMERICAN DEPARTMENT.

No kind of classification has been made, and we believe at one time it was doubtful whether an American Court would be opened at all. Even now we may say that the arts and manufactures of the United States are unrepresented. The collection we have in the south-eastern angle of the building is not here through the patronage or encouragement of the United States Government, which has other work on hand. It was through the enterprise and creditable ambition of a few private individuals, who were determined to show, at their own risk and on their own responsibility, that there is inventive skill in America, which is not afraid to measure itself against that of Europe in the same direction. Not a single Southern State is represented. This may be on account of the blockade, but it is said that had there been no blockade at all, the South, though she might have shown well in natural productions, could have made no figure in manufactures or mechanical inventions. The State of New York, and the Northern States generally, have been the fertile source of all the inventions which have been patented since the Exhibition of 1851.

The United States Court is represented by Mr. Holmes, and his son-in-law, Mr. Taylor, an eminent engineer. It is due to the energies and sacrifices of these gentlemen that America is represented at all, and the things which their public spirit has brought together indicate the actively practical mind of their countrymen. There are nearly a hundred articles in the various classes exhibited, and most of them have the merit of novelty, as well as utility.

Samples are here of a farinaceous article manufactured by the Glencove Starch Company, of New York, under the name of "Maizena." It is the purest preparation of the finest maize. In a short time, and without any trouble, it can be made into various forms of diet, and is a good substitute for arrowroot.

Near the south-east entrance one is attracted by a cork-cutting machine invented and patented by Mr. Conroy, of Boston, which cuts cork into parallelpipedons, and then into smaller figures according to the length of bung or cork required. The ease with which this machine does its work is surprising. A clever cork cutter, working by the hand, can turn out, on the average, eight gross of corks a day. By this machine can be made fourteen gross of corks per hour. In a day of ten hours, therefore, two men can produce 20,160 corks or bungs, while two men by the hand in the course of the same time can turn out only 2,304. The corks can be cut in perfect cylinders, or beveled to any angle required by slightly elevating the horizontal disk. The machinery is very simple, and ingenious through its simplicity.

A bolt is shown in one part of the Court, which has all the excellency of the rivet, with this advantage over a rivet, that when required it may be moved from its place without any trouble. It is well adapted for the framework of locomotives and railway carriages. The bolt passes through an iron frame, or through woodwork, and is secured behind by a nut. The nut is kept into its place by having a spring inserted into it, which adapts itself to the ratchet work of a hollow washer. The inventors are Messrs. Lawrence and White, of Melrose, N. Y. Close to the screw-rivet bolt is a contrivance for common land carriages.

There are four exhibitors of pianos, all of New York city or county. These instruments vie in tone, and power, and in cabinet work, with any in the other courts of the building. In power, we suspect that they will carry off the prize against all competitors. We had the opportunity, at least, of listening to a square and a grand exhibited by Steinway & Sons. The internal arrangements of these instruments are novel; the strings are not all in parallels like those in the usual pianos; on the contrary, the bass strings are placed at acute angles above the tenor and treble strings, and obtain the full advantage of the sounding board. The motions of the hammers are not impeded by this arrangement. The grand has seven octaves, and tone loud enough for a large concert room, and yet, through the mechanical arrangements of the instrument, it can be made to play as softly as if it had been intended for a sick chamber.

FATAL EXPLOSION OF GUN COTTON---DEATH OF A PROMISING YOUNG CHEMIST.

A few months ago the writer of this made the acquaintance of L. M. Dornbach, a young chemist, a graduate of the Lawrence Scientific School, at Cambridge. He was a man of uncommon energy and perseverance, and had so diligently prosecuted his studies, that he was regarded by some of our learned professors, who knew him well, as one of the most thorough chemists in the city. Last winter, when a contract was made with the Government for a large supply of Doremus's cartridges, the manufacturers formed an arrangement with Mr. Dornbach to make the gun cotton with which these cartridges are coated. He hired an isolated three-story brick building above the settled portions of the city, and commenced the manufacture. He had been at work but a short time when, one morning as he was going to his manufactory, he discovered that the house was gone. At that time a small proportion of chlorate of potash was mingled with the gun cotton, and some 250 pounds of this dangerous explosive were stored in the building. By some unknown means fire was communicated to the inflammable materials in the middle of the night, and a terrific explosion ensued, so completely demolishing the structure that not one brick was left upon another. The building was near Columbia College, and we heard Professor Joy say that the peculiar violet-colored light which is produced by the combustion of the chlorate of potassa, illuminated every room in the college.

After this occurrence the chlorate of potash was omitted from the compound, and Mr. Dornbach removed his operations to the outskirts of Williamsburg. He hired a lot, inclosed it with a high board fence, and erected a small wooden building in one corner for his manufactory. It was his practice, after the cotton had been submitted to the action of the acid, to spread it upon the ground to dry, and when dry to pack it in barrels for transportation. The compressing in the barrels was effected by pounding the cotton down with a wooden pestle, and, as it is well known that gun cotton, under certain conditions, will explode by percussion, this mode of compression had been a subject of discussion between Mr. Dornbach and Professor Seely. But Mr. Dornbach said that though he had some apprehension at first, he had made experiments which had satisfied him that the practice was free from danger, and his confidence was confirmed by the opinion of some other good chemists.

On Saturday, the 21st of June, Mr. Dornbach was packing some of the gun cotton with his own hands, and had placed in a barrel about 30 lbs., which he was driving down with a stick of wood, when it exploded, burning his hands and arms and setting his clothes on fire. He ran to the building, where his assistant was at work with an abundance of water, for the purpose of having his blazing garments extinguished, but a fragment of his clothes fell upon the floor, setting fire to about 150 lbs. of gun cotton in the building. A second explosion took place, blowing out one side of the building, still further injuring Mr. Dornbach, and severely burning the hands and face of his assistant. Both of the men walked to the house, about a quarter of a mile distant, neither thinking that he was dangerously hurt. But the next day Mr. Dornbach exhibited symptoms of having been injured internally by inhaling a portion of the hot gases, and at midnight he died.

We are acquainted with no one whose prospects were brighter than those of the young man whose career is thus suddenly and sadly closed. He was from Mechanicsburg, Pa., and was 30 years of age at the time of his death. He was a young man of great promise.

THE experiments at Shoeburyness, England, with shot against iron targets, have developed some curious results. The appearance of a conical iron shot after having struck the iron target, is like that of a birch broom hollowed in the center. When the point of the cone strikes the target, it is stopped, but the surrounding portions of the shot move forward, and slide over the center as a core, and thus produce the form described.

A Line of Battle.

This expression often occurs in referring to the order of troops on the battle field, and it is doubtless the opinion of many that the two armies stand in two lines; but it is not so.

The army is divided into divisions, and there are often great gaps between the divisions. They are posted in positions, or in commanding places—that is, on hills, or in woods, or on the banks of streams, in places where they will be best able to resist or attack the enemy. The divisions are usually so placed that they can support one another. You can understand a line of battle pretty well, by imagining a regiment here on a hill, another down in the valley, a third in a piece of woods, with artillery and cavalry placed in the best positions. If you want to make it more real, when you are out in the fields or pastures, with the hills all around, just imagine that the enemy is over yonder hill, with ten thousand men and twenty pieces of artillery. You are a general, and have an equal number. The enemy will come down that road, spread out into the field, or creep up through the woods and attack you.

You can't exactly tell how many men he will send on the right, or how many on the center, or how many on the left; so you must arrange your forces to support each other. Then, to shift it, you are to attack him. You don't know how his troops are arranged, for he keeps them concealed as well as he can. You don't want many of your men killed, but do want to win a victory. Now there is a chance for you to try your skill in planning a line of battle. You must place your artillery where it will do the most damage, and receive the least from the enemy. You must move your infantry so that they will not be cut off by the enemy before they get near enough to cut them up in return. You see that it is no small thing to be a general. These are great responsibilities.

FIGURES ON DRESS PARADE.—A correspondent in alluding to an extract copied into a late number of the SCIENTIFIC AMERICAN, under the above caption, makes the following calculation:—Six hundred thousand men would extend in single ranks $227\frac{3}{11}$ miles, allowing two feet to a man. In double ranks they would extend $118\frac{7}{11}$ miles, and if formed in a hollow square, in double ranks, it would measure $28\frac{6}{22}$ miles on each side, and inclose nearly 807 square miles. They would stand on $55\frac{35}{363}$ acres, or nearly $\frac{1}{11}$ of a square mile, each man occupying four square feet.

WOOL EXHIBITION.—There is to be a great wool show under the supervision of the Ohio State Agricultural Society at its annual exhibition to be held at Cleveland, September 15 to 19, 1862. Competition is open to the world. Wool will be divided into four classes. 1st. Fulling wools. 2d. Delane wools. 3d. Cassimere wools. 4th. Combing Wools. Twenty-five fleeces must be exhibited to entitle exhibitor to a premium. Mr. S. N. Goodale, of Cleveland, will have charge of this department.

VARNISH DRAWINGS.—Boil some clear parchment cuttings in water, in a glazed earthen vessel till they produced a very clear size; strain it and keep it till wanted, then give the work two coats of the size, passing the brush quickly over the surface, so as not to disturb the colors. Or, mix one ounce of Canada balsam and two ounces of spirits of turpentine together, then size the print or drawing with a solution of isinglass in water and when dry apply the varnish with a camel's-hair brush.

BLUE COLOR FOR STAMPING.—Take one ounce of Prussian blue, pound it to powder and dissolve it in a little gum water wherein is mixed a little oxalic acid and white sugar. By having a greater or less quantity of water mixed with the blue and thickened with gum, dark and light shades will be produced, as may be desired.

This war has proved that the United States have more military resources, and can put into the field greater armies, than any nation on the earth. It has proved that the United States Government has no friends among the governments of Europe, and furthermore that it needs none. It has proved that the genius and mechanical skill of American inventors is as remarkable in war as in peace.

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POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

The regular weekly meeting of the Association was held in their room at the Cooper Institute on Thursday evening, June 19th, Dr. Stevens in the chair.

PREMIUMS OF THE AMERICAN INSTITUTE FOR 1862.

Mr. FISHER, Secretary *pro tem.*, read a communication from the Board of Managers of the American Institute, stating that they had delegated the award of premiums to be given by the Institute this year to the Polytechnic Association and the Farmers' Club. A list of the premiums, and the subjects for which they were offered, was embraced in the communication, and a request was expressed that a report of the awards should be ready by the 31st of December.

Mr. DIBBEN—I see Mr. Johnson here, who is a member of the Board of Managers, and I would like to ask what steps are to be taken to inform those who would be likely to compete for them, in regard to the subjects for which premiums are offered by the Institute?

Mr. JOHNSON—The Managers will furnish the Association with circulars for distribution.

Mr. DIBBEN—This was the course that was adopted last year, and as I served on one of the committees for examining articles submitted for competition, I know how the plan worked. It was a complete failure. Since the premiums were awarded, I have met half a dozen persons who had valuable and interesting inventions that they would have liked to submit for competition, if they had known that the Institute was about to bestow premiums. If the offers had been published in the popular scientific papers, like the SCIENTIFIC AMERICAN, they would have come to the knowledge of almost everybody in the country who would care to submit their articles for examination, and we should have had a much fuller competition, and our premiums would have been more satisfactorily bestowed.

I move, Mr. Chairman, that a committee of three be appointed by this Association, to confer with the Board of Managers of the Institute, in regard to advertising the offers of premiums.

Prof. SEELY—Mr. Chairman, I second the motion, and I indorse all that Mr. Dibben has said. I also was familiar with the operations last year, and I know that the plan of sending circulars is entirely inefficient. If every member of this Association should send a number of circulars, at an expense of two or three dollars to himself, not one in a thousand of those who would like to compete for these premiums would be reached, but an advertisement in the SCIENTIFIC AMERICAN would reach 15,000 readers, or perhaps 30,000.

Mr. DIBBEN.—One hundred thousand.

Prof. SEELY—One hundred thousand readers, including all the professional inventors in the country; while a short advertisement in *Silliman's Journal*, would reach all those who would be likely to write essays.

Mr. STEVENS—I have been all through the States of Vermont, Maine, New Hampshire and Connecticut, and I found in every machine shop a copy of the SCIENTIFIC AMERICAN hanging up in one corner. If you want to get at the makers of machinery there is no doubt about the proper course—you must publish your notice in the SCIENTIFIC AMERICAN.

Mr. JOHNSON—The Board of Managers have considered this subject, and I have no doubt that they will agree with this Association in regard to the proper mode of giving publicity to our offers of premiums.

The Chairman appointed Messrs. Dibben, Seely and Babcock, a committee to confer with the Board of Managers of the Institute, and the Association proceeded to the discussion of the regular subject of the evening,

SUPERHEATED STEAM.

This subject was discussed at the last meeting before this, but on that occasion most of the evening was devoted to descriptions of the different kinds of apparatus employed, illustrated by drawings on the blackboard, and, as engravings would be required to make the descriptions intelligible, the discussion was not reported. It is to be presumed that all of the plans of any value have been illustrated and fully described in our pages.

Mr. BABCOCK—Mr. Dibben requested me to describe a superheater which has been in use in Mystic, Conn., for the last six years, giving perfect satisfaction, requiring no repairs and saving 25 per cent of the fuel. (The speaker proceeded to make a drawing on the blackboard, and describe the apparatus of Stillman & Wilcox. The heat employed is taken directly from the fire box, not being the waste heat, as usual, and a self-operating valve regulates the amount of superheating.

Prof. SEELY—The heat used in superheating is commonly waste heat, or the heat going up the flues, in the products of combustion. Such heat makes no extra cost, and all that gets into the steam, shows itself in mechanical force. The heat, however, which gets into the water in the boiler, is not all available in work; until the water reaches the boiling point, the expansion, although of great force, is of such narrow limits, that we do not use it. To raise water from 0° to 212°, 20 per cent as much heat is required, as to raise it then into steam; and this 20 per cent gives no motion to the engine.

But the value of superheating is more plainly shown, in another direction, and by using figures. In order to be easily understood I use only round numbers, but numbers which are very near the exact truth:—1 lb. of water at 212° is converted into 1,700 volumes of steam, by 1,000 units of heat. The 1,700 volumes may be taken as the measure of the available mechanical force; the 1,000 units of heat are worth 1,700. Now, if these 1,700 volumes of steam at 212°, be raised 500° higher, or to 712°, the bulk will be doubled; for the heat put into the steam we have another 1,700 volumes; or, in other words, the heat used upon the steam has given us the same value as the heat used upon the water. How much heat is there required to raise 1 lb. of steam 500°? The specific heat of water is 1, and the specific heat of steam 5, or a unit of heat will raise 1 lb. of water 1°, and 1 lb. of steam 2°. But in our case, suppose the steam was raised 500°, and now it is evident at a cost of 250 units of heat. 250 units of heat used in superheating steam has done the work of 1,000 units used upon water; heat goes four times farther on steam than on water.

If waste heat is used for superheating the steam to 712°, we double our power without increased cost for fuel; or, if the heat costs at the same rate as when used in water, we double power at an additional outlay of 25 per cent. In the first case we realize a total gain of 50 per cent, and in the second of 37½ per cent. But, unfortunately, it is not yet practicable to use steam at a temperature so high as 712°—the materials we use about our engines will not endure it, we can, however, practically use steam at about 400°, and thus realize an economy as high as 25 per cent.

Superheated steam is now much used in chemical operations, as a convenient means of heating and to effect certain decompositions. Superheated steam upon iron, at a red heat, gives its oxygen to the iron and its hydrogen escapes; upon carbon, at a white heat, its oxygen unites with the carbon to form carbonic oxide and carbonic acid, and the hydrogen is set free; upon metallic sulphides, the hydrogen unites with the sulphur to form sulphide of hydrogen, and the oxygen with the metal; upon oils, when the fat acid is seperated from the glycerine, &c. &c.

Mr. ROWELL—I hold in my hand a table of the observations made at one of the series of experiments which were tried at the Metropolitan Mills in this city, in 1860, to test the value of superheating steam and of working steam expansively. These experiments were made under the direction of B. F. Isherwood, now Engineer-in-Chief of the U. S. Navy, at a cost of about $5,000, which was paid by Mr. George Hecker. They were commenced on the 1st of February, and finished on the 1st of November. An engine was constructed expressly for the purpose, and it was the first time in the history of the steam engine, in which an engine was made for the single purpose of testing questions in regard to its operation. The fuel and water of condensation were carefully weighed, and the temperature and pressure of the steam in all parts of the apparatus, as well as the temperature of the room, the barometric pressure, the temperature of the feed water, and, in short, all circumstances that could affect the result were carefully observed and recorded every hour. It was the most valuable, as well as the most costly, series of experiments that have ever been made in regard to the practical working of steam,

The plan of superheating was to surround the cylinder with a steam jacket, and then throttle the steam in the cylinder, so as to reduce its pressure without diminishing its temperature. It was found that there was no marked economy in superheating more than 5°. At this extent of superheating, the economy was 54 per cent; that is to say, 46 pounds of coal, with this method of superheating, did as much work as 100 pounds of coal, with steam used in the ordinary way.

Mr. DIBBEN—I introduced this question with an idea that the facts brought out would show that the prejudice against superheated steam is not well founded, and the discussion has fully sustained my opinion. The statement of Mr. Babcock shows that if a superheater is properly constructed, there is no burning out of the tubes, about which we have heard so much, and the working of Ericsson's air engines, proves conclusively that lubricating materials will bear a temperature of 450° without being decomposed.

On motion of Mr. Dibben it was voted that the meetings of the Society, during the summer, should be held monthly, on the second Thursday of each month, and the Society adjourned to the second Thursday in July.

The British Patent Laws.

The following sensible remarks are from the London *Engineer*:—"We are to have a commission to inquire into the working of the law of patents. Ever since patents for inventions were first granted, their operation has been, in many respects, unsatisfactory. That the balance of advantage has always been greatly in their favor has been generally believed, and there are abundant reasons for the conviction that anything like the abolition of patents would be attended with great national loss. Nothing of that kind, however, is at all likely at present, and the commission to be appointed by the Queen will have only to consider wherein patents may now be granted undeservedly, and how the inequalities and inconveniences attending the system may be reduced to a minimum. In bringing forward his motion for an address to the Queen, Sir Hugh Cairns expressed himself in terms much the same as those which we long ago adopted in treating of the whole subject of patents. He clearly distinguishes that, while no inventor has an inherent right to a patent, he has an unquestionable right to conceal anything he may have invented unless the public make terms with him for its disclosure. That, without some encouragement to divulge their plans, inventors would generally prefer to keep them secret is not only evident enough of itself, but even some of those, including the *Times*, who have lately attacked patents altogether, have formerly given great prominence to this consideration. More than ten years ago, and before the passage of the Patent Law Amendment Act of 1852, the *Times* wrote as follows'':—

> The law, however, regards those who wish to derive a pecuniary benefit from the result of their labor, inquiry, and ingenuity; and we ask what such men would do, supposing no law existed by which they could secure a property in that which they had discovered? The answer is obvious; they would endeavor to keep their process a secret, and in those cases in which secrecy is impossible, they would have no motive to go through the trouble and expense of discovery. Where secrecy might be possible, we should find the new process fenced round by every mystery and mystification which the ingenuity of the discoverer could devise. Secrecy would be enforced on workmen, as far as possible, by keeping them in ignorance; and when this became no longer feasible, the sanction of oaths would be employed to that end. A state of most painful suspicion and restraint would be the condition of every one who was in possession of an invention, and of all whom he employed. A more mischievous, as well as a more disagreeable condition, can hardly be conceived.

The London *Times* is not the liberal paper that it was a few years ago, before it became the property of Rothschilds. Once it was the voice of the English people and advocated their interests, now it is the organ of the bankers and the great capitalists, hence its wheel about on the patent laws, and its opposition to mechanics and inventors, and also the Northern States of America which represent the honored industry of the Republic.

A CORRESPONDENT writing to us from Canada West, states that on the night of the 16th June a severe frost visited nearly all that Province and cut down the corn, melons, beans, &c.

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Improved Iron-Hub Carriage Wheel.

The annexed engravings illustrate a wheel hub invented by C. Leavitt, of Cleveland, Ohio, which the inventor claims to be rather superior to any heretofore introduced to the public. Its construction is novel and will be readily understood by examining the cuts, of which Fig. 1, is a perspective view, Fig. 2, a longitudinal, and Fig. 3, a cross section Fig. 1. represents a portion of the spokes cut off even with the surface of the hub in order to show their relative positions.

The hub is formed in two sections, *a* and *b*, which fit upon the pipe box, *c*, and are held in place by a shoulder and the nut, *d*. In the two sections, *a* and *b*, are formed radial mortises to receive the spokes as shown in Fig. 3; the mortises in the section, *a*, to receive one half of the spokes, *e e e*, and the mortises in the section, *b*, to receive the other half of the spokes, *f f f*. It will be seen that the tenon portion of each spoke has half of its width in the iron mortise, while the other half is between two of the spokes in the opposite section of the hub, thus each spoke is held partly by wood and partly by iron. The tenons of the spokes taper only one way, two of the sides being parallel, and the other two converging toward the end.

In forming the wheel, the pipe box is taken from out the hub, and the spokes are driven into the mortises as hard as they will bear, when their inner ends are reamed off even with the interior surface of the sections, *a* and *b*, so that when the pipe is introduced the inner ends of the spokes rest against its external surface.

The sections, *a* and *b*, are drawn firmly against the spokes by screwing the nut, *d*, upon the end of the pipe box, and if the spokes are at any time loosened by shrinking, they may be readily tightened by screwing this nut farther upon the pipe box.

If a spoke is broken it may be readily replaced by taking off the nut, *d*, without disturbing the other parts of the wheel.

The wheel is held upon the axle by the nut, *g*, which is covered by a cap, *h*, to confine the grease within the hub.

The inventor claims that though this hub is more expensive than a wooden one, the whole wheel made with this hub is as cheap as a wheel with a wooden hub; owing to the great economy of labor in forming the spokes and putting the parts together. The other advantages claimed are the facility with which the wheel can be taken apart to replace a spoke or any other part that may become worn or injured, especially for the renewal of the pipe box which is so difficult in wooden hubs; the ease with which the wheel can be oiled without taking it from the axle; its neat and ornamental appearance; but especially its great strength and durability.

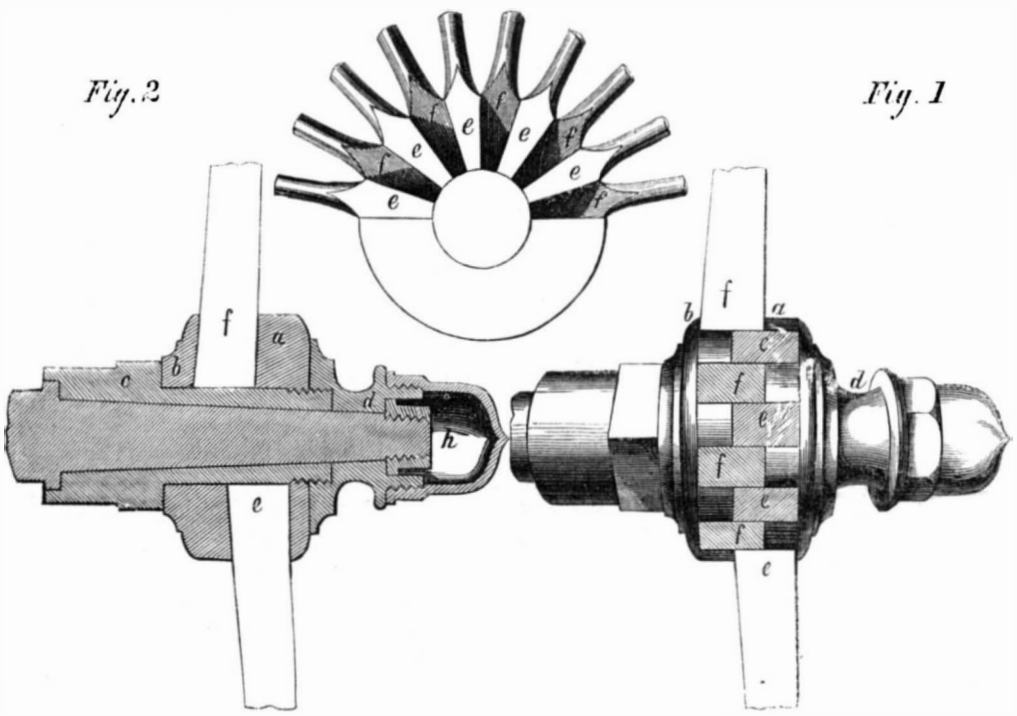
We commend this wheel to carriage makers, and to our army officers and army wagon contractors as well worthy of thorough examination and trial.

The patent for this invention was granted January 14, 1862, and further information in relation to it may be obtained by addressing the inventor, at Cleveland, Ohio.

Fig. 3

Fig. 2

Fig. 1



LEAVITT'S IRON-HUB CARRIAGE WHEEL.

Parlor Pastime—The Lampascope.

Many of our young friends will be pleased to hear something of this simple invention, so capable of affording them amusement. It consists in the application of the principle of the magic lantern and the dissolving view to an ordinary table lamp. To construct a lampascope (presuming the possession of a lamp), the ordinary globe must be removed, and in its place a cardboard box, square, round, or octagonal, as is most convenient to make, must be substituted, and into one side of this two tubes of cardboard must be inserted, after the manner of an ordinary magic lantern. Into these tubes, which slide one within the other, lenses are to be fixed, say the lens nearest to the light shall be of two inches focus, and the one in the inner tube or outer lens of three inches focus. According to the relative power of the lenses, so will be the size of the picture on the wall; thus the lenses may be of various focuses, and not exactly, unless convenient, to the measure we take as the example; which, however, will be well understood by those whose knowledge of the laws of optics may induce them to make this lampascope for the entertainment of their friends. Between the lenses and the light a place must be made for the purpose of inserting the slides of figures to be represented on the wall upon which the disk of light is thrown. These figures may be painted on glass slides by the amateur himself, or purchased ready for use. Some very beautiful views, portraits, &c., may now be had on glass, applicable to this purpose, produced by the collodion and photographic process, and at a price suitable to most pockets. Having thus far constructed the instrument, we have only to hang up a sheet against the wall to make it white, and having put our lampascope on the lamp, a round disk from the lenses will be shown on the sheet. The tubes must be regulated like a telescope to make the picture distinct; and according to the character of these so will the exhibition be, "grave or gay, lively or severe."

Musical Sounds Produced by Electricity.—Mr. George Gore has devised the following beautiful experiment:—A pool of mercury, from one to three inches diameter, is formed in a circular vessel of glass or gutta percha; this is surrounded by a ring of mercury about one-eighth to one-tenth of an inch wide, and both are covered to the depth of about half an inch with rather a strong solution of cyanide of potassium. The pool of mercury is then connected by a platinum wire with the positive pole of a powerful voltaic battery and the ring of mercury is connected with the negative pole. A continuous harmonious sound is then produced.

Large new copper smelting works are about to be erected at Ontonagon, Lake Superior. The main building is to be 100 feet long by 60 in width. The roof is to be of sheet iron similar to that of Park, McCurdy & Co.'s smelting works in Pittsburgh, Pa.

Great quantities of ivory are obtained from elephants that are found imbedded in the ice fields of Siberia, destroyed and preserved thus by some manner only to be conjectured.

A Powerful Hydraulic.

In California a hydraulic is a high head of water conveyed through a pipe and applied to wash down the face of gravelly hills and banks containing the auriferous deposits. Thus applied, water exerts a tremendous force in leveling hills and exhuming the golden nuggets. At Brandy City, in Northern Sierra, are rich and extensive diggings, which have been hard to work on account of cement and hard gravel; but they have several powerful hydraulics now at work there, one of which has a fall of 240 feet through 15-inch iron pipe. This is said to be the most powerful in the State, and will lift boulders or detachments of cement of a tun weight when brought to bear beneath them.

Preservation of Grain in Air-tight Bins.

We find in *Le Gènie Industriel* a notice of a report recently made to the Society of Civil Engineers in Paris, by M. Doyère, giving an account of a long series of investigations and experiments made by him in relation to the preservation of grain. M. Doyère comes to the conclusion that the very best mode of preserving wheat and other grains is by inclosing them in air-tight boxes, which are buried in the earth, or deposited in cellars beneath the surface. He says that the best material for the boxes or bins is sheet iron in very thin plates, galvanized, or covered with zinc, and painted on the outside with bitumen.

The principal purpose of M. Doyère's report is to give an account of five experiments on a grand scale which have been made at Paris, Alger, Cherbourg, Brest, and Toulon, from 1854 to 1861, to test this plan. The conclusion formulated in the documents is, that the wheat, in all the cases, came from the bins the same as it went in, weight for weight, quality for quality. It was preserved without deterioration, without detriment and without expense. In addition it is stated that the iron bins cost from one-half to three-fifths as much as ordinary granaries.

Nicaragua Emigration Movement.

A Company is now forming in this city for the purpose of founding a practical working colony in the Republic of Nicaragua, Central America. Mr. T. C. Leland, 614 Broadway, New York city, is Secretary of the "New York and Nicaragua Colonization Association."

Late advices from Central America state that the Nicaraguan gold mines in the department of Chontales, and near Libertad, were attracting considerable attention from American capitalists, particularly in California. It is said that the mines are very rich, and that the aid of coal and machinery alone is required to render them profitable.

Photography in the Catacombs of Paris.—M. Nadar, the photographist, has obtained permission from the municipality of Paris, to carry his apparatus down to the catacombs, where, aided by the electric light, he is photographing a series of views. By means of this magic lantern he and his assistants, now in the bowels of the harmless earth, will enable people to become familiarized with scenes which but few have witnessed.

Colt's Armory at Hartford now employs about 1,100 men; and the pay roll amounts to nearly $50,000 a month. The value of the machinery and tools in the old armory is stated at about $500,000. An additional building is now being erected, which will double the size and capacity of the establishment.

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Correspondence

Rediscovery of the Formation of Nitric Acid by Electricity.

Messrs. Editors :—Recently, in making some experiments with an electrical machine, in connection with which some vessels of electrified water were used, I observed that when a succession of sparks was passed through a stratum of air impregnated with moisture, a peculiar odor, which I took to be that of nitric acid, was perceptible. This was altogether different from the odor of ozone which is generated when the electric spark is made to pass through dry air or oxygen gas. Prosecuting the experiment, I found that when several discharges from a battery of Leyden jars were conducted over the surface of a stratum of water, the water became acidulated so as slightly to affect the color of test papers. When a solution of caustic potash was substituted for the water, after many discharges, crystals of niter were obtained by evaporation.

Whether these are original discoveries I do not know. It is probable that others, in making similar experiments, may have noticed such phenomena. The practical application which I propose to make of them, however, I think is new.

That nitric acid is generated by the action of the spark upon the air is unquestionable. My theory of the operation is this :—The affinity between oxygen and azote being very weak, and atmospheric air being simply a mechanical mixture of those gases, it may be supposed that their atoms. as they exist in the air, are not brought within the sphere of mutual attraction. Now, it is well known that when an electrical discharge takes place through the air, the latter undergoes a violent agitation, the most notable feature of which is a sudden expansion of volume. Probably condensation takes place also, and prior to expansion, but so suddenly and so immediately followed by the expansion, which may be only the recoil of the condensed gases, as to be imperceptible. When this condensation is sufficiently violent the dissimilar atoms are brought within the sphere of affinity, combination ensues and the nitric acid generated is absorbed by the water or alkaline solution. May not the extensive beds of niter found on or near the surface of the ground, in various parts of the world, be formed in a similar manner by the action of discharges of lightning from the clouds? The nitrous earth of caves and old buildings probably arises from the decay of organic matter.

The application which I propose to make of my discovery (?) and upon which I wish to ask your opinion is this :—For the electrical machine and battery of jars substitute a powerful electrical apparatus driven by steam for the generation of the nitric acid—is it not probable that this costly chemical may be thus economically manufactured? Or, by the use of the alkaline solution, the nitrate of potash, of so much political importance in the present state of national affairs? And since condensation is the agent which produces the result, let the stratum of air which should be pervaded by a system of broken conductors, in order to multiply the spark, be subjected to powerful mechanical pressure in order to increase its effect. Or, where it is convenient, erect instead of the electrical apparatus, a system of ærial conductors to collect and apply the atmospheric electricity.

May I ask you to state, among your "Answers to Correspondents," in your valuable paper, your opinion as to the feasibility and economy of the manufacture thus hinted at, and also whether a patent could be procured for the process and machinery necessary to carry it into practice. Should you think proper to address me upon the subject, by letter, I should be greatly obliged, but I suppose your time is not sufficiently at your disposal to admit of such special attention. R. D.

Washington, D. C., June 2, 1862.

[The fact that nitric acid is formed by the passage of electricity through the air was discovered by Cavendish, a rich old bachelor and amateur student of science, who died in England in 1810. It seems to have been rediscovered by our correspondent. We do not believe that he will find this an economical mode of making either nitric acid or nitrate of potash, but should be pleased to hear the results of his experiments. A new process of manufacture is patentable. —Eds.

Information about Milling.

Messrs. Editors:—As the Scientific American diffuses more mechanical knowledge than any paper in America, I peruse its columns with a great degree of interest. Having noticed in No. 23, vol. vi. (new series), two questions, one on stone dressing and grinding, the other on bolting, I as a practical miller, accept the invitation to answer, and will do so according to the experimental knowledge that I have on the subject. After trying many experiments, and with a practice of twenty-eight years, I will say that the first principal in dressing stones is to secure the right proportion of face and furrow. Second, to have them only where they are needed. Third, to give the furrows the right width and depth. Fourth, to arrange the draft that it will receive the grain freely and distribute it properly over the entire surface of the stones, so as to produce the greatest quantity of good flour from the smallest quantity of wheat, and with the least power.

Before describing the dress that I have adopted to accomplish these ends, I will make a few comments on the various other dresses that have been in general use for the last thirty or forty years, in order to point out their principal defects, and the better to explain the advantages that this dress possesses over them. Now, it will be noticed by making a draught of the old "straight-quarter dress," as it is commonly called, having the bed stone with the runner lying upon it (diameter of stone four feet; draft of leading furrow four inches, measuring from center of stone to feather, or cutting edge, with thirteen sections and three furrows to the sections, and lands of equal width at each end), that it is a very unequal dress. We will suppose the leading furrow to be right, which I believe it is, or nearly so, as the draft of the center is very great and the motion very slow. This draft decreases to the periphery, at the same ratio as the motion and centrifugal force increases. The leading furrow being right, the first short furrow is certainly wrong, because the draft is much greater. And the second furrow is still worse, as the draft is greater still. These furrows cross at the periphery at nearly a right angle, and at about the same angle as the leading furrows cross at the eye, hence it is evident that large quantities of meal enter these furrows improperly ground, and they are thrown out by the great draft and pass off into the offal. There is also too much face at or near the eye. This hinders the easy reception of grain, and prevents proper ventilation, which are indispensable to good and fast grinding. The same difficulties attend the circle-quarter dress, and all of the circular dresses that I have ever known, as based on the old Elmore plan, patented in 1833, namely, on circles varying from four and a-half to six feet, with from thirty-six to forty-two furrows, one half of them running to the eye, and the other half running to a point, and terminating about six inches from the eye, leaving a land at this point about three inches wide. It is evident, that with a small amount of furrow and a large amount of face, at or near the eye, that the grain enters a narrow furrow and passes over a broad face, consequently it performs its cracking of the grain, and nearly all the finishing too near the center, where the motion is too slow to do good work. This leaves the skirt of the stone comparatively nothing to do but flutter and wear out of face.

I will now describe the dress that I have adopted. Stone four feet diameter, and of medium quality as regards closeness or openness, as is commonly termed by millers; draft four inches, measuring from center of stone to feather, or cutting-edge of furrow. Divide the stone at periphery into thirteen sections, and divide these sections by two furrows, making three furrows to the section, and thirty-nine in all. Connect the first furrow with the leading furrow at the eye, so as to make the first land a quarter of an inch wide at the eye. Connect the second furrow with the leading furrow, so as to make the second land three-quarters of an inch wide at leading furrow. The third land necessarily terminates at a point about eight inches from the periphery. The lands are all of the same width at periphery; the furrows straight and one and-a-half inches wide throughout, and three-sixteenths of an inch deep in bed-stone, and a quarter of an inch deep in runner. Bring them up on a true bevil, or inclined plane to the face, finish them very smooth with a sharp pick, give them a nice cutting-edge for about six inches next the eye, and the remainder of the distance to periphery without the cutting-edge. Keep the faces about one-thirty-secondth of an inch lower around the eye as far as the cutting-edge of the furrow extends. It will be seen by making a draught of this dress, that the furrows at, or near the eye, cross at nearly a right angle, and at half the distance from eye to periphery at an angle of about 45°, and decreases in the same proportion to periphery. By means of the tapering lands, the draft in the two short furrows is nearly the same as in the leading furrows, which I believe to be about correct. The true theory of stone dressing is slowly being disclosed by practice. It is now proved that the only face necessary where the stone receives its feed, is sufficient only to crack the grain. With the narrow lands, broad furrows, and great draft, the grain is drawn freely between the stones and is slightly crushed and moved rapidly from the eye and distributed over the entire surface of the stones, the lands gradually increasing in width as the finishing becomes necessary. In regard to grinding wheat, all the apparatus connected with the stones should be in the most perfect working order. I have found in practice that the spindle is an important consideration. I would not use one less than six or seven feet long, and having a diameter corresponding with its length, to prevent springing. The pressure of the spur wheel when running causes less friction at the upper bearing, or neck of the long spindle, than in the case of a short spindle, thus rendering it less liable to heat, get loose, and injure the grinding. Another consideration is the point and step. It frequently happens that the pressure of the spur wheel against the spindle point, causes the step to wear out of a true circle. In tramming the spindle, great care should be taken to press the point hard in the same direction that the spur wheel presses it when grinding, otherwise there is no certainty of its being in tram when at work. This is required whether the step is worn out of shape or not, as it is necessary to give the point a very little play to guard against accidental heating and expansion. Another important point is the fitting of the bail and driver. The bail should be so constructed and placed in the stone as to leave the heaviest portion of the stone below its resting point on top of the spindle. Great care should be taken to have the bearing points of the driver equal when the face of the runner is at a right angle with the spindle.

I will present information respecting the balancing of the stones, their speed, size and weight, and also remarks on bolting in another communication next week. J. R.

Ann Harbor, Mich., June, 1862.

The Armor Plate Question in California.

Messrs. Editors :—Gentlemen I have inclosed you a small gold piece and trust its radiant face will be a guarantee that your paper is really appreciated and that it will insure a continuance of its receipt. We have had a heavy winter up here (six thousand feet above the level of old ocean), a pleasing proof to you I hope of the great altitude your paper has already reached. While the little hills have been skipping like young rams and our Halleck has been thundering in the South West the Scientific American has come regularly by every mail. As a blue jacket you have my humble thanks for the jealous care with which you have watched over the interest of our navy. I should be much pleased to know that your paper was circulated in every company in our army and as a seaman I would cheerfully contribute my mite to furnish each mess of every naval ship afloat belonging to good old Uncle Sam a copy. Cannot something be done for our brave boys in the manner indicated. Neptune's intellectual gems would sparkle all the brighter for it. We are having quite an exciting time over iron-clad gun boats. The "cheese box" seems to be the pet; every body you talk with is sure we have reached perfection in that line, but your humble subscriber doubts it very much. He well remembers when quite a boy of aiding in the first experiment in the year 1845 in a large vessel of war

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with the screw. This was tried in the frigate *St. Laurence* (the old *Shannon*) on the Medway river under specifications submitted by Commander Flemming, R. N., to the Admiralty. The screw was worked by the chain-pump brakes managed by sixty-five men. We were cast loose on an ebb tide and succeeded in turning her against wind and tide. I think the object of this trial was to demonstrate the practicability of handling a dismasted ship in action (the *St. Laurence* being a hulk passed over) this was a small beginning and you know what a revolution has since followed. Liners, frigates and corvettes are now filled with powerful screws working up to many hundred-horse power, thus enabling them to now perform what was then impossible. And so with iron-clad ships, we have made a good small beginning, but a very short time will prove them only second rates. By all means let us have a fleet on proof but let them be built on sound pirciples demonstrated by practical trials.

FRED. MACDONALD.

Lake Bigler, California, May 11, 1862.

More Questions for Millers.

MESSRS. EDITORS :—You will oblige me by publishing the following in the SCIENTIFIC AMERICAN. I have read the question by a "Young Miller" and all the answers given, but did not learn all that I would like to.

I would like to know what is the best size for a millstone and what is the best kind of dress, viz., the number of furrows and their form, also the cracks to the inch and the speed required to do the best work. Then I would ask what length bolt you would use, and what diameter and what fall to the foot; also what kind of cloth you would use for both grist and merchant work, and what speed would be required for the same. Any more information you can give in respect to milling, that you think may be beneficial, will oblige

A YOUNG MILLWRIGHT.

Shullsburg, Wis., June 9, 1862.

Fly Wheels of Sawmills.

MESSRS. EDITORS :—We noticed on page 374, (present Vol. SCIENTIFIC AMERICAN over the signature of "H. F.," the inquiry whether the balance in the flywheel of a saw mill should be equal to the saw frame and crank and whether the balance should be put directly opposite to the crank? Having some practical knowledge in sawmilling and millwrighting we will give our views.

For an ordinary sawmill the flywheel should be 6 feet in diameter and weigh six hundred pounds. The balance should not equal the frame and crank by 30 or 40 as the motion of the saw will make up for the difference in weight. The balance weight must be put opposite the crank, so that the centrifugal force of the one will exactly balance the other. A. H. & J. A. BUCKWALTER.

Kimberton, Pa., June 10, 1862.

Setting a Quarter Twist Belt.

MESSRS. EDITORS :—Your correspondent "V," is all right in his rule for setting a quarter twist belt, although I do not think his general practice will apply to mechanics in this latitude; for when an apprentice, thirty-five years ago, I saw one put up for the first time without shifting and trying. I studied it and solved the problem, and have verified it in practice (and a pretty large one), ever since. Query? Does the same rule hold good when the shafts are at other than right angles? VULCAN.

New York city, May 31, 1862.

What May Be Seen in a Life Time.

An old negro, who says he was born one hundred and three years ago, now sits about on the steps of the only two brick houses in Yorktown, and tells the Northerners how his master Robert Anderson, was the host of General Washington, after the capture of Cornwallis; and how he knows his age because he remembers General Washington perfectly. His present master, son of Washington's host (or grandson) is now in the rebel army; and this old patriarchal servant of three generations is left to take care of himself in his supra-centennial existence. "What are you going to do—how do you get your meals now-a-days?" asked my friend. "Oh the men here give me plenty to eat. I do very well." The old fellow was not at all concerned about his future treatment. But what suggestive pictures are the two great struggles he has lived through on that peninsula at intervals of 80 years.

Utility of the Morse Magnetic Telegraph.

The following letter from Parker Spring, Superintendent of the Construction of U. S. Military Telegraph lines, gives an interesting account of the services of the Morse telegraph to the army, and of Gen. McClellan's use of it :—

GAINES' HILL, Va.,
7 miles from Richmond, June 2, 1862.

From the time the army of the Potomac first left Washington the United States Military Telegraph has never for an hour been allowed to remain in the rear. Before reaching his new headquarters Gen. McClellan almost invariably learns that the wire is on the advance; that an office has already been opened at the point designated before he left his old camp, and that communication to the War Department at Washington is open for him. In several instances when the army had marched fifteen miles in one day, the telegraph had reached the new quarters two hours in advance. When our troops are obliged to remain a few days in one position, wires are immediately run from Gen. McClellan's quarters to the headquarters of all commanders of divisions, thereby placing the entire section of country occupied by our troops under his instant control. Assistance like this is surely valuable to our glorious cause, and, I am happy to say, it is fully appreciated by the General.

Saturday previous to the evacuation of Yorktown, Gen. McClellan ordered me to run a wire into our battery No. 6, in order to give him telegraphic communication from his headquarters, which were distant about one and a half miles. This battery laid half a mile in front of Gen. Heintzelman, and within half a mile of a long chain of rebel batteries. The office at battery No. 6 was to be located under ground, in a bomb-proof arrangement, in order to save the precious life of the manipulator, who would be in his hole before daybreak the next morning. I was informed by Gen. Heintzelman's aids that it was a very hazardous experiment; that from the point where the line must cross the fields the rebel officers could be heard distinctly giving command; that the rebel tickets were within 250 yards of us, and if we attempted to distribute poles with our wagon we would be fired upon. Of these facts I informed all our men. Regardless of danger, they unanimously voted for the extension. Fortunately that night was dark, and promptly at 9 P. M. we were in readiness to commence operations.

After cautioning all hands to work quietly, I detailed the men as follows : Cosgrove, Hoover, Greiner and McGuffie to dig holes; Rote, Keiler, Benedict and Jones to distribute poles on their shoulders, who had to carry them a full mile. John Tryer I posted as guard. His duty was to watch the flash of the rebel guns, and notify the men, who were working and could not see, when to fall on the sod, should the rebels hear us and open. Thus far all was quiet in the secesh quarters. Scarcely had our operations commenced when a compliment from Gen. Magruder in the shape of a shell was sent us. Through the timely notice received from our guard, Mr. Tryer, that "he saw a flash, and that something with a fiery tail was coming toward us," we were enabled to drop. It came within fifty yards of us, bursted, but did no damage. After that shot and shell followed in rapid succession, until we completed our task, which, owing to loss of time in dodging, occupied fully five hours. A number of these missiles fell within thirty feet of us, showing conclusively that the rebel pickets had discovered our operations, and were directing the fire of their artillery. We have preserved pieces of a shell that knocked down a pole behind us, which had been erected not five minutes before the shot was fired. The line was run through a soft corn-field, and it was amusing next day, after the evacuation, when we returned to this field, to see the life-like pictures of Tryer, Cosgrove and several others, nicely portrayed in the mud, and which no artist in the world could excel. They were at once recognized by all hands, and I promised to give you the particulars.

The telegraph has been called upon to perform a still more mysterious wonder. For some time past I have been ordered by Col. Eckert (our superintendent of military telegraphs), to try a telegraphic experiment from a balloon. Saturday morning, when we heard that a great battle must be fought, Prof. Lowe notified me that I should extend the wire to his balloon, and we would try it. In one hour we had brought the wire a mile and a half, and I was ready to ascend with the Professor. The battle had commenced. When it had reached its zenith, Prof. Lowe and myself, with the telegraph, had reached an altitude of 2,000 feet. With the aid of good glasses we were enabled to view the whole affair between these powerful contending armies. As the fight progressed, hasty observations were made by the Professor and given to me verbally, all of which I instantly forwarded to Gen. McClellan and Division Commanders through the agency of the obedient field instrument, which stood by our side in the bottom of the car. Occasionally a masked rebel battery would open upon our brave fellows. In such cases the occupants of the balloon would inform our artillerists of its position, and the next shot or two would, in every case, silence the masked and annoying customers. For hours, and until quite dark, we remained in the air, the telegraph keeping up constant communication with some point. From the balloon to Fortress Monroe, a distance of over 100 miles, this wire worked beautifully. A number of messages were sent and received between these two points, and had it not been for the tremendous rush of business on the wire, I should have telegraphed you directly from the balloon, while the battle was raging. Sunday morning, at daybreak, we again ascended. Early in the morning the battle was renewed, and with more fierceness than the day before. Incessant firing of musketry and artillery was kept up until noon, when I had the extreme pleasure to announce by telegraph from the balloon, that we could see firing on James River, to the left of Richmond, distance from the balloon, some said, fifteen miles. This fire was of short duration.

The streets of Richmond in the morning presented a deserted appearance, but very few people to be seen in the streets. During the afternoon and evening of Sunday nothing of interest transpired beyond the removal of the rebel dead and wounded, all of which we could distinctly see from the balloon. Every available machine that had wheels was brought into requisition for this purpose. From the scene of battle into the City of Richmond, the road was literally lined with ambulances, wagons and carts, conveying dead and wounded. About twilight we saw camp fires innumerable around the city; smoke issued from all their hospitals and barracks, which showed us to a certainty that the main body of their army had fallen back to Richmond. Monday morning we made several ascensions, and found a small force near the last scene of action, and thousands of troops marching out from the city; so you may look momentarily for a report of another severe battle.

A Good Word.

SCIENTIFIC AMERICAN.—We want to repeat our former kind word of this excellent and substantial weekly—published in New York. It is in quarto form, 16 pages. Every intelligent farmer and mechanic ought to have it. He will certainly lose treble its cost, if he does not. It keeps one well posted in all the mechanical movements of the age, and furnishes him with topics for thought—and thinking makes the man as it makes the world. "By thinking," said Sir Isaac Newton, "I have triumphed." Not only, is the AMERICAN beautifully printed and well filled with solid matter, every number is handsomely embellished with clear, bright, rarely executed wood engravings. How nice a volume, bound, will a six month's or a year's subscription make! Take our word for it, young thinkers, and supply yourselves with the SCIENTIFIC AMERICAN. We say this word for your good.—*N. H. Journal of Agriculture.*

PINS were worth a dollar a paper in 1812, and were poor at that. Then it took fourteen processes to make a pin; now only one, by a machine which finishes and sticks them into the paper. Saving pins, a half a century ago, was as important as saving cents, and hence the habit thus formed sticks to many elderly gentlemen whose coat sleeves are ornamented with rows of them, rescued from loss.

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Hinged Plates for Pianofortes.

Science and mechanical skill undertake one of their most difficult and delicate tasks when they attempt to improve the pianoforte. The sensitive ear of the skillful musician detects the slightest inaccuracy, not merely in the harmony, but also in the volume, the tone, the rythm, the melody, of all the various sounds that enter into the composition of music, and the formation of these sounds of the proper quality, and their combination in exact harmony is certainly one of the nicest of all arts. The universal love of music has created an enormous demand for the most fashionable musical instrument, the piano ; and this great demand is constantly stimulating the numerous manufacturers to make improvements in the instrument, in order that their own articles may be more acceptable to the public than those of their rivals. Many of the patents granted are for modifications which are no improvements, but the few actual improvements which have been patented have shown that there is hardly any department in which good inventions are more profitable.

Horatio Worcester, an old-established and well-known manufacturer of pianofortes, of this city, has recently invented a modification in the plate of pianos designed especially to increase the volume and improve the quality of the tone. The modification consists in making the plate in two pieces, and connecting the piece to which the strings are attached with the stationary piece by a hinged joint, so that the hinged piece may vibrate with the strings. The invention is illustrated in the annexed engravings.

The stationary piece, *a*, Fig. 1 of the plate, is secured firmly to the piano in the usual manner, and the piece, *b*, is connected with it by a hinge at *c*. This piece is represented detached in Fig. 2. The hinge is formed by catching the slot, *c*, upon a short stud which rises from the stationary plate below. The strings are attached to the opposite edge of the hinged piece, *b*, as indicated, supporting this end of the plate simply by their tension.

As the combined strain of so many strings amounts to some five or six tuns, it is necessary to counteract it by devices of corresponding strength. Braces, *d* and *e*, are accordingly introduced to hold the piece, *b*, against the strain of the strings. These braces are made of metal, and are represented detached in Figs. 3 and 4.

By this arrangement the vibration of the strings is imparted to the piece, *b*, prolonging the note, giving increased volume to the tone, and imparting to it a singing quality which has been much admired by the most eminent musicians of the city. The inventor describes the freedom given to the sounding board by the hinged plate as similar to that found in the violin, the action of the tail piece of which beautiful instrument furnished the suggestion for this improvement. It will be observed that this plate strengthens the treble and tenor portions of the scale which are usually the weakest parts of the keyboard. It is estimated by the inventor and by impartial musicians who have tried pianos with this hinged plate, that the improvement *doubles* the volume of sound.

The patent for this invention was granted June 3, 1862, and further information in relation to it may be obtained by addressing the inventor at the corner of Third avenue and Fourteenth street, New York city.

F. Walton, of London, manufactures a substance from linseed oil, which answers as a substitute for india rubber in many cases. The oil is boiled until it becomes a thick substance like glue. It is then mixed with a portion of shellac and rolled into sheets under warm heavy iron rollers. Waterproof boots, shoes, blankets, picture frames, &c., have been made of it. It is mixed with sulphur, and vulcanized like india rubber.

WORCESTER'S HINGED PLATES FOR PIANOFORTES.

Fig. 1

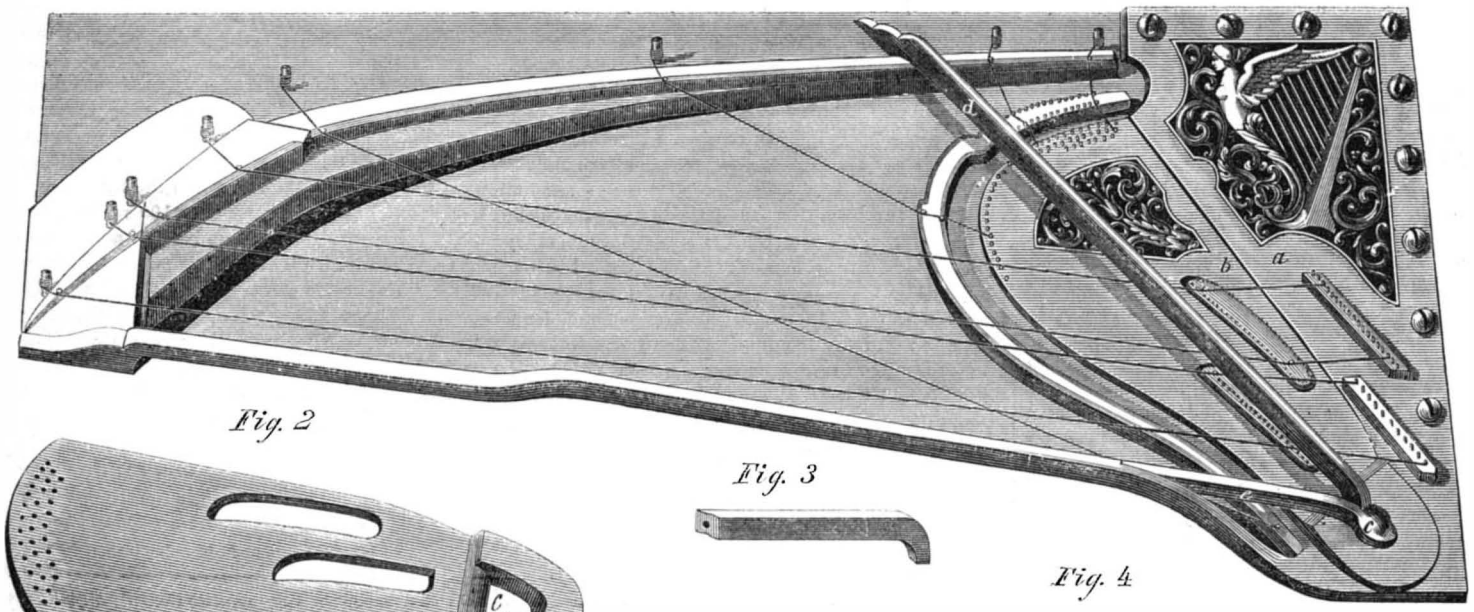


Fig. 2

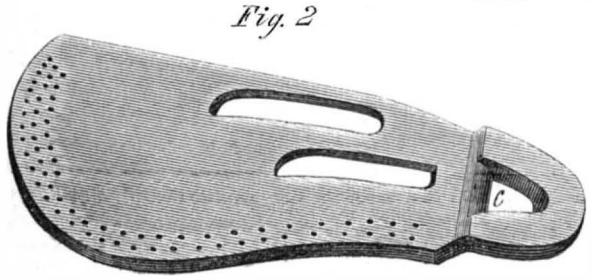
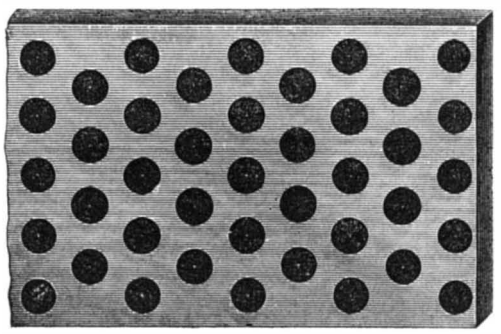


Fig. 3

Fig. 4

VANDERBILT'S POLISHING BELT.

The annexed engraving represents a polishing belt invented by George R. Vanderbilt, of this city. It is



formed by inserting plugs of emery in a leather in the manner represented. The holes are cut in conical form, being smallest at the polishing surface, and the plugs of emery are made to fit the holes ; a strip of cloth upon the back side holds the plugs in place. The emery is fastened together with a suitable cement, which wears away with the leather, and thus the plugs act as constant feeders to the entire surface of the belt. The belt, consequently, requires no replenishing with emery until it is entirely worn out. It may be connected at the ends to form an endless belt and run on two pulleys, or it may be secured to the periphery of a wheel to form a polishing wheel.

This belt has been tried at the Novelty Iron Works, in this city, and is pronounced by the foreman a good article.

Application for a patent for this invention has been made through the Scientific American Patent Agency, and further information in relation to it may be obtained by addressing the New York Emery Wheel Company at 116 Nassau street, New York city. [See advertisement on another page.]

Paraffine as an Engine Lubricator.

The common lubricating agent usually employed for the pistons in steam engines, is melted tallow. In the cylinders of engines in which superheated steam is used the tallow is very liable to be decomposed and its beneficial action as a lubricant thereby destroyed. And in those engines which have surface condensers, the steam passes from the cylinders to the condensers, thence to the boilers carrying with ti much tallow, the acid of which is liable to act chemically upon the brass tubes of the condenser, forming verdigris, which is transmitted to the boiler. When this verdigris comes into contact with the iron of the boiler, under a high beat, it is decomposed, and the copper contained in it developes a galvanic action when in contact with the iron wheel, the latter is subject to rapid corrosion. Such is the theory of the action of tallow used as a lubricant in steam engines. As a substitute for it, Mr. W. Fairbairn, F. R. S. recommends paraffine. It is not decomposed by superheated steam, and it does not act chemically on brass tubes.

Suspension of Cotton Growing at the South.

Returned prisoners from the South state that, so far as they saw and heard, the cultivation of cotton is almost entirely suspended in those States that used to produce that staple. In the early part of the present spring cotton planting was commenced, but suppressed by proclamations by the governors of the cotton States, who enjoined the planting of corn instead. The planters were by no means disposed to obey these arbitrary ukases, but they were frightened into submission by the threat of a tax to the full value of the product. The consequence is, no more cotton is planted than will suffice for seed for an ensuing crop ; but instead of the deposed monarch, King Cotton, King Corn wields the scepter—nearly the entire cotton lands being converted into one vast corn field.

A Safe Railroad.—The New Jersey Railroad Co. (Jersey City to New Brunswick, 34 miles) has been organized thirty years, and since the road went into operation upward of 39,000,000 passengers have been transported over it, without the loss of a single life in any of the cars. During the past year alone nearly 3,000,000 of passengers have been carried over the road, without any serious accident to any one, except those who have either jumped from the trains while in motion, or otherwise jeopardized their own lives by violating the rules of the company.

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VOL. VII. NO. 1.....[NEW SERIES.].....*Eighteenth Year.*

NEW YORK, SATURDAY, JULY 5, 1862.

SIX GOOD REASONS WHY EVERY MANUFACTURER, MECHANIC, INVENTOR AND ARTIZAN SHOULD BECOME A PATRON OF THE "SCIENTIFIC AMERICAN."

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THE NEW AMENDMENTS TO THE PATENT LAWS.

We publish on another page the Patent Law Amendment Act which has recently passed the House of Representatives. We hope all our readers will peruse it carefully, with our comments thereon, and if they concur with us in thinking the first section is one which should not become a law, we hope they will use their influence in opposing the measure. By what shadow of right an inventor should be required to pay $20 for the privilege of asking the Commissioner to revise the decision of his Examiner, is what we could never understand; but so long as there was an intermediate tribunal between the Examiner and Commissioner, wherein the inventor could seek redress for any erroneous decision of the former, without paying an additional fee, we did not deem it necessary to protest against the section in the existing law which provides for the payment of $20 on appeal to the Commissioner. But now it is proposed to abolish the Board of Examiners-in-Chief, which was created to review the decisions of the Examiners, and to apply the services and wisdom of the three, who constitute this Board, to aid the Commissioner in performing the same duties which have heretofore devolved solely upon them; in other words, they are to perform the same duties as heretofore, but in their new relation as "advisory to the Commissioner of Patents," inventors appealing to them, to correct erroneous decisions of the Examiners, must pay a fee of $20.

Where an inventor applies for a patent and receives letters from the Department, signed by the Commissioner, he naturally supposes that he is in correspondence with the head of the Patent Office. If his case happens to be rejected, he receives a letter *signed* by the Commissioner, which sets forth, briefly, the reasons for the rejection. The inventor examines the cases referred to, and becomes satisfied the decision is incorrect. He writes his views upon the subject and sends them to the Commissioner, and a letter is received in reply, stating that the previous decision of the Office is confirmed. Not satisfied with this summary disposal of his case, and thinking he may not have clearly explained the difference between his invention and the cases referred to, he writes again; and then, for the first time, he is informed that if he wishes his case reëxamined he must first remit a fee of $20 in addition to what he has already paid, and the *Commissioner* will give the subject his personal attention.

The first section of the proposed amendments of the Patent Law, if enacted, will place an applicant for a patent, who is so unfortunate as to have his case rejected, in just the predicament above stated. We do not believe the revenue of the Patent Office could be increased by the proposed amendment, but, on the contrary, if enacted, it would deter many persons from applying for patents who can afford to pay the $35, but who would not risk the exaction of an additional fee of $20 before they can have the decision of the Examiner reviewed by the person—Commissioner—with whom they naturally supposed they were doing their business.

We hope the gentlemen comprising the Senate Committee on Patents, will examine the first section of the proposed amendment, and if they consult the interests of inventors, we are sure they will report adverse to its passage.

EXPERIMENTS WITH A SUBMARINE CANNON.

On Saturday the 21st of June, a respectable number of people collected at the Club House, Jersey City, to witness some experiments with Duffy's submarine gun. This gun is the invention of Joseph Duffy, of Paterson, N. J. The gun is placed on a deck in the vessel as far as possible below the water line, with the muzzle end passing through a stuffing box in the vessel's side. Mechanism is so arranged that when the gun is forced inboard by the muzzle coming in contact with the side of a hostile ship, the gun is discharged, sending not merely the shot, but also a considerable portion of the expanding gases into the hold of the enemy's vessel. Valves are provided to prevent the ingress of water as the gun is driven inboard by the recoil.

A small model was provided for the experiment, and was placed in the bow of a skiff, about 20 inches below the surface. The boat was rowed stem on against an oak target, and as the gun struck, it was discharged, driving the shot through two 3-inch planks, and considerably shattering the target. The result was entirely satisfactory.

CALIFORNIA STATE AGRICULTURAL SOCIETY.

We have received from O. C. Wheeler, Esq., Corresponding Secretary of the California State Agricultural Society, a communication stating that the flood in Sacramento last winter materially injured the cabinet and utterly destroyed the library of the Association. They request copies of the Transactions of kindred societies, files of papers, and specimens in natural history, to aid them in the restoration of their well-begun work of collecting the natural history of the Pacific coast, and furnishing the agriculturists, miners, and mechanics of California with such a library as will at all times meet their wants.

Nothing in the history of California is more surprising than the attention to intellectual culture which has accompanied her wonderful career. Very early after the tide of emigration commenced, free schools were established all over the State, scientific and literary associations were formed, her unparalleled mineral deposits were explored by competent geologists, and her students of natural history disputed with Agassiz the claim to certain discoveries in ichthyology.

We have no doubt that this call for contributions to the cabinet and library of the State Agricultural Society will meet with a prompt and liberal response. All parcels should be addressed to the Society, in care of O. C. Wheeler, Corresponding Secretary, and each should be accompanied by the address of the contributor and any facts that may be useful to the Society.

LOCOMOTIVE BUSINESS IN PATERSON—A NEW DUMMY ENGINE.

The city of Paterson, N. J., has long maintained a high reputation for building locomotive steam engines. Last year this business was almost suspended, but it has since greatly revived, and is now rapidly improving. There are three large locomotive establishments in Paterson, viz:—The Rogers's Locomotive Machine Works, the New Jersey Locomotive and Machine Company, and Danforth, Cooke & Co's. Locomotive and Machine Works. In the latter there are about two hundred and thirty men now employed. One dummy engine for drawing the cars of the Hudson River Railroad through the streets of New York is now being built there. It is the third of this character provided for the same company. The two which were previously furnished have, after a long trial of their qualities, given great satisfaction. The dummy is a condensing locomotive of peculiar construction, and its object is to supersede horses in the streets of the city. Outwardly it resembles a big box on wheels, like a freight car with a chimney. This long box is made of boiler iron; it has double hollow sides which contain water, and forms the tank of the engine. The boiler, engine, condenser and pumps are placed within this box and supported on a suitable framing. The boiler is vertical and tubular, and spreads out toward the top. The engines consisting of two horizontal cylinders with their appurtenances, are placed in front of the boiler, and very nearly in the middle of the car, inside of the wheels. The cylinders are each ten by fifteen inches, and their piston rods work a transverse double crank shaft situated close to the lower part of the boiler. On the outer ends of this shaft are grooved friction pinions, each twelve inches in diameter; these gear into large grooved friction wheels, each thirty inches in diameter, and from the shaft of the latter, motion is given by connecting rods to the two front and two back driving wheels at each side. This frictional gearing, as a substitute for cog gearing for reducing the speed of the driving wheels, is an excellent arrangement. One of these dummy engines will haul thirty-four cars. The speed, of course, is slow, but this is a necessary requirement for large cities. The object of using a condensing locomotive for such a purpose, is to obviate the noise peculiar to the exhaust in the smoke stack. The cylinders of the dummy exhaust in front into a small tubular condenser, the condensing water of which is supplied from the tank. The water to feed the boiler passes from the condenser by a tube into a cylindrical iron well situated under the two feed pumps, which are placed close together between the two cylinders, and are worked from the link motion. The feed is thus always proportioned to the amount of steam consumed, which is carried at from 110 to 140 lbs. on the inch, and is cut off short. The construction of such an engine is far more difficult than a common locomotive, because it embraces more parts, and these are required to be arranged in a very small compass. Coke is used as the fuel so as to obviate smoke, and a blower is employed to furnish the draft. One beautiful large ten-wheeled locomotive for Cuba, is now about finished here, and will soon be sent away. It is furnished with two common feed pumps, a Giffard's injector, and a hand pump for the boiler. An order of fifteen locomotives for the Atlantic and Great Western Railroad—which is to tap the oil regions of Pennsylvania—is being filled up; two engines are

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being built for the Raritan and Delaware Bay Railroad, and several large freight engines for the Delaware, Lackawana and Western Railroad.

The New Jersey Locomotive and Machine Company, have now over two hundred men employed. An order is also being filled by this company for seven locomotives for the Atlantic and Great Western Rail road. Five of these will be large freight engines with four feet drivers, and they will use bituminous coal. Two will be wood burning passenger engines, with five and a half foot driver wheels, and cylinders sixteen by twenty-two inches. A large freight engine with six four feet drivers, a two-wheel Bissell truck, and cylinders eighteen by twenty-two inches, is also being constructed for the New Jersey Central Railroad. It is designed to burn anthracite coal, and will draw from eighty to a hundred loaded coal cars. The fire box of this engine is very long; it has a hundred and ninety tubes and a total heating surface of one thousand two hundred square feet; the grate bars are water tubes. This engine is to be provided with one feed pump and one Giffard injector for the boiler. An engine of the same size was recently built by this company for the New York and Erie Railroad, which was furnished with two of Giffard's injectors and no feed pump. This locomotive has worked very satisfactorily. A large wood burning engine belonging to the Erie Railroad, is now being converted into an anthracite coal burner in this establishment. The furnace is eight and a half feet long; a long thin fire is required, and hot air is fed to it through the furnace door, which is formed into a box; the air passes through small holes in it, and becomes heated before it reaches the fire. The engineer's platform, or foot board, is at the side; the fireman's is on the tender. A first class engine is now nearly completed for the Government, to be employed on the military railroads in Virginia. It is the second furnished by this company for the same purpose within a very short period. The materials and workmanship are first class.

Rogers's Locomotive and Machine Works are very extensive. There are about four hundred hands employed at present, mostly on locomotives. A large and beautiful steam plow of the Fawkes class, is standing here all complete. It has two cylinders, eight by twelve inches; a corrugated driver roller, four and a half feet in diameter, and six feet broad in the face. It is capable of tearing through twenty acres of stiff land in one day. Beside it stands a large locomotive which was built for a railroad in South Carolina, but fortunately it was not sent away to Dixie. [The New Jersey Locomotive and Machine Company, have also on hand a set of large flue boilers which had been built for a Southern cotton factory.] Two first class coal burning locomotives, with combustion chambers and copper-lined fire boxes, are now being constructed in Rogers's Works for Cuba; one wood burner for Dubuque, Iowa, and several orders for other places are in the course of being filled. A most favorable opportunity is afforded in this establishment for comparing the present with the past era in locomotive construction. Here on the outside of the shop is to be seen one of the old fashioned eight tun dumpy engines which were early used; and inside may be seen some elaborately-finished engines weighing from twenty-six to thirty-five tuns. American built engines have the preference in Cuba and in South America. Two locomotives furnished a few years since by this company for a railway in Chili, surpassed two English-built engines in speed and power of haulage up steep gradients upon a fair trial. A splendid new engine for the same railroad was lately forwarded from this establishment.

Formerly much cast iron was employed in the framing of locomotives; now only the best wrought iron is used, and the frames are all massive and rigid. The workmanship displayed and the materials employed in all these establishments, are of the first quality. None of the Paterson companies are working up to their full capacity, but they all say, "we are doing a very good business in railway machinery." Rogers's Works and Danforth, Cooke & Co'.s, also manufacture cotton machinery; but little is now doing in this line. Coal-burning engines are becoming numerous in comparison with wood-burners. They effect a saving in the cost of fuel ranging from twenty to more than thirty per cent. Giffard's injectors for locomotive-boiler feeders, is also a noticeable and novel feature. They possess the important advantage over pumps in being able to feed the boiler while the engine is standing with steam up. It is gratifying to know that the manufacture of railway machinery, which is a great branch of national industry, is in such an improved condition. It also indicates the condition of our internal commerce.

PATENT LAW AMENDMENTS.

SECTION 1. *Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled*, That from and after the passage of this act the three Examiners-in-Chief created by the act of March second, eighteen hundred and sixty-one, to which this is additional, shall not constitute an independent tribunal in the Patent Office to revise and determine upon the validity of the decisions made by the Commissioners of Patents in the refusal of Letters Patent or in interference cases; but that the duties of said Examiners-in-Chief shall be only advisory to the Commissioner of Patents, who shall prescribe rules for their action. And after the second rejection of an application for a patent, or after one decision by the Commissioner, in cases of interference, the party who may be dissatisfied with such decision may appeal therefrom to either of the judges of the circuit court for the District of Columbia.

SEC. 2. *And be it further enacted*, That every patent shall be dated as of a day not later than six months after the time at which it was passed and allowed, and notice thereof sent to the applicant or his agent. And if the final fee for such patent be not paid within the said six months the patent shall be withheld, and the invention therein described shall become public property, as against the applicant therefor: *Provided*, That in all cases where patents have been allowed previous to the passage of this act, the said six months shall be reckoned from the date of such passage.

SEC. 3. *And be it further enacted*, That so much of section seven of the act entitled "An act to promote the progress of the useful arts," approved July four, eighteen hundred and thirty-six, as requires a renewal of the oath, be, and the same is hereby, repealed.

SEC. 4. *And be it further enacted*, That whereas the falling off of the revenue of the Patent Office required a reduction of the compensation of the examiners and clerks in the office after the thirty-first day of August, eighteen hundred and sixty-one, that the Commissioner of Patents be, and he is hereby, authorized, whenever, in his opinion, the revenue of the office will justify him in so doing, to pay them such sums, in addition to what they shall already have received, as will make their compensation the same as it was at that time.

REMARKS ON THE ABOVE.

SECTION 1.—We very decidedly object to the passage of this section, for reasons which we will now explain. When an application for a patent is rejected the applicant, if he is dissatisfied with the decision, has but to renew his oath of invention and demand a rehearing before the same Examiner, and if his case is again rejected, and he still deems the reasons insufficient, he has a right to take his case to the Appeal Board, composed of the three Examiners-in-Chief, and have it carefully examined by them. This involves no additional expense, and hundreds of cases which are rejected by the primary Examiners are appealed and allowed, and many worthy inventors thus able to secure their just rights in the Patent Office. It is now proposed by this bill to deprive inventors of the full benefits hitherto enjoyed from this Appeal Board. As the law now stands, whenever the applicant has exhausted all the other remedies within his reach in the Patent Office, he can, on payment of a fee of $20, appeal his case to the Commissioner of Patents in person and afterward to one of the judges of the District Court by the payment of an additional $25. Under this section of the amendment here proposed, the Examiners-in Chief are reduced to the position of clerks or Assistant Examiners to aid the Commissioner, and no applicant for a patent can have the benefit of their opinion unless he pays the required appeal fee of $20. The present system has now been in operation substantially for several years and has worked admirably. No change is desired or sought for by the great body of inventors who, from time to time, seek the protection of the Patent Office. Then why this proposed change? We suppose it is wholly based upon a desire to increase the revenue for the Patent Office. Judging from the large amount of business constantly before the Appeal Board the Committee on Patents has been made to believe that here, in this particular department, is a chance to give one more turn to the financial screw upon the neck of the poor inventor. But we are almost certain that the result will not justify the experiment, as few, comparatively, will risk the payment of an additional fee of $20, upon the hypothesis that the Commissioner will take a more enlightened view of the case than that of the primary Examiner, and thus many a worthy inventor will be turned out of the Patent Office with his rejected claims for lack of ability to pay for the examination of his case on appeal.

We are decided in our conviction that an applicant for a patent has a right to the opinion of the Commissioner of Patents whenever a question arises between himself and the Examiner respecting his claims, and this right he ought to be allowed to exercise without the payment of an additional fee. In this respect the law as it now stands is wrong, but no complaint has been made against it so long as there existed a competent tribunal in the Patent Office to which such appeals could be made. It is a piece of gross injustice to take this right away from the inventor, and we hope the Senate will either reject this clause or so modify it that an additional fee shall not be exacted. As this clause now stands it is an injustice to inventors, and ought not to become a law.

SECTION 2.—There can be no good objection to this requirement. There is no reason why a patentee should not pay the second patent fee within six months after his patent is allowed. As the case now stands the law puts no limit on the time when the payment should be made, consequently there are hundreds of suspended cases in the Office awaiting the voluntary payment of the required fee, impoverishing the Patent fund.

SECTION 3.—This is a very sensible amendment. The renewal of the oath is useless and involves a great deal of unnecessary delay and trouble, especially in all foreign cases. Commissioner Mason first introduced this system of requiring a renewal of the oath. We never regarded it as either necessary or requisite, and it ought to be abolished.

Value of Railway Inventions.

It is questionable whether in any other interest as many and as valuable patents have been taken out as in connection with the railroad, during the last forty years. Invention has built it up from nothing to the representative of at least twelve hundred millions of dollars, in this country alone. Yet the career of improvement seems as far as ever from having reached a limit; indeed, no bound to inventive progress can be imagined. Every invention calls into existence a class of others as necessary accompaniments. The business of procuring patents has become a recognized pursuit, as much as the importing of dry goods or the sale of hardware. Among those who have entered upon it, we need not do more than name Messrs. Munn & Co., publishers of the SCIENTIFIC AMERIACN A visit to their establishment in the "*Times* Building" will amply repay the stranger the time required, if he have a taste for mechanical pursuits. We need not say it has no rival in the world, as it has none in this country. This will be best understood from the circumstance that in seventeen years they have acted as agents for more than fifteen thousand inventors, or nearly one thousand per annum. With the utmost readiness to befriend the great interest with which they are so closely identified, Messrs. Munn & Co., have the amplest facilities, both in this city and Washington for aiding inventors in the matter of procuring patents.

[We copy the above excellent notice from the *American Railroad Journal*, which has been published in this city since 1831. It is a most valuable and reliable journal in all questions relating to railways and enjoys a deservedly high character.—EDS.

Two extensive iron rolling mills are going up in Chicago.

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RECENT AMERICAN INVENTIONS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week. The claims may be found in the official list on another page :—

Reciprocating Pump.—This invention consists in the employment of a compound piston or one provided with two valves opening in opposite directions in a right line and used in connection with a water-tight partition or abutment placed within the pump cylinder, and in such relation with the two piston valves, the eduction or discharge opening, and a water passage communicating with the pump cylinder, that by a simple reciprocating movement of the piston, each valve will alternately propel the stream in the same direction through the pump. Each valve, during its reverse movement, allows the streams to pass freely through it, thereby operating with a moderate expenditure of power, admitting of a rapid movement with but little wear and tear of the working parts, and raising and forcing a large volume of water in a given time. The inventor is Wm. D. Andrews, of New York city.

Feed Regulator for Steam Boilers.—This invention relates to that class of boiler feed regulators which effect the movement necessary to set the feed pump in operation or produce the suspension of its operation by means of the expansion and contraction of a pipe, which is arranged at the intended water level of the boiler. This pipe receives from the boiler either steam or water, according as the water therein is above or below a certain level. It consists, first, in a novel system of levers for connecting the said expanding and contracting pipe with the belt shipper or other device for bringing the feed pump into or out of operation, whereby a small movement of the pipe is made to produce a considerable movement of one of the levers, and the necessity for making the expanding and contracting pipe of great length is obviated. It also consists in a novel contrivance for producing a copious flow of cool water into the expanding and contracting pipe, when the water in the boiler rises to a certain level, and so providing for the rapid contraction of the said pipe and stoppage of the operation of the feed pump. The inventor is Charles H. Brown, of Fitchburg, Mass.

Revolving Firearm.—This invention relates to cylinder revolvers having their cylinder frames made in two pieces to open at the lower front corner by a movement on a hinge joint at the upper rear corner, for the purpose of introducing the cartridges into the chambers from the rear of the cylinder, and it consists in a downward continuation of the upper part of such frame to pass over the rear of the cylinder at the point where the hammer strikes the cartridge, in such a manner as to form a recoil shield which is nearly or wholly independent of the breech piece or usual recoil plate, and of the lower part of the cylinder frame, thereby relieving the said piece or plate and the hinge joint of the strain of the recoil. The inventor is L. W. Pond, of Worcester, Mass.

Revolving Firearm.—This invention consists in the employment, in a revolving firearm, of a continuous frame rigidly attached to the barrel, inclosing the cylinder lengthwise, and pivoted to the stock in such manner as to enable the rear part to fold into the breech piece and to form a recoil plate independent of the breech piece, for relieving the breech piece of the strain of the recoil. This frame allows the cylinder and breech piece to be separated for the introduction of the cartridges into the chambers at the rear thereof. It further consists in so applying the cylinder axis pin, in combination with such continuous frame, that it passes through the said frame and cylinder, from front to rear thereof, and enters a hole in the breech piece in such a manner as to secure or assist in securing the said frame in proper connection with the breech piece. The inventor is J. H. Vickers, of Worcester, Mass.

Railroad Car Brake.—This invention relates to an improved car brake by which the brakes of a series of connected cars may be simultaneously operated from the locomotive, either by steam or by friction, from one of the driving wheels thereof, or each individual car be operated by a brakeman, as in the ordinary brakes in common use. Its object is to obtain a simple and efficient brake capable of being operated as specified, and one which will admit of all the wheels of a series of cars comprising a train, being subjected to a uniform pressure so as to prevent any of the working parts of the brake being subjected to any undue strain, torsion or pressure and breakage and all unnecessary wear and tear consequently avoided. A. J. Ambler, of Milwaukee, Wis., is the inventor.

Surgical Splint—This invention is chiefly designed for the treatment of fractures and other diseases of the long bone of the thigh and leg, and in certain cases of the arm also. Its principal peculiarity consists in applying the permanent dressing to the sound instead of to the diseased limb, and making the counter extension upon the splint instead of by direct contact with the body. The diseased limb can thus be examined at any time by removing the bandages without disturbing the splint. The extension bandage is applied to the foot independently of the footboard. A register is employed to indicate the degree of extending force applied, and to show if any change occur in the resistance of the limb. The invention also affords an accurate means of ascertaining the relative length of a healed and an uninjured limb, effectually preventing fraud by voluntary contraction by the patient. This apparatus is the invention of Dr. M. M. Latta, of Goshen, Indiana.

Weaving Shuttles.—It is well known that the shuttles of common construction are liable to be rendered entirely useless by a lateral blow upon the metal tip splitting the end of the wood. This invention consists in applying an annular ferrule beneath the surface of the wood in such a manner as to effectually prevent the splitting of the shuttle while in use or with any violence to which it is subject and this is accomplished without impairing the smooth surface necessary toward the point. The invention is likewise applicable to the repair of shuttles of common construction which may have been split, so that shuttles otherwise entirely useless may be made as good as if no accident had occurred. C. L. Frink, of Rockville, Conn., is the inventor of this improvement.

Attachment to Lamp Chimneys—This invention consists in the arrangement of a receiver in combination with the chimney of a kerosene or other flame, in such a manner that water or other liquid poured into said receiver can be heated by the action of the flame in an easy and convenient manner ; it consists further in the arrangement of a window in the lower part of the metal chimney, in such a manner that the flame can be observed from the outside, and that sufficient light is allowed to pass out into the room to render this device available for a nurse lamp. W. L. Fish, of Newark, N. J., is the patentee of this invention.

Stump Extractor.—The object of this invention is to obtain a stump extractor of simple construction which may be readily drawn from place to place where required for use, and be capable of being operated by one or two horses, as circumstances may require. To this end the invention consists in applying to a shaft, on which the lifting chain is wound, a wheel toothed at its inner periphery to receive, at opposite points, the pinions of two drum shafts on which ropes are wound in the same directions, the horses being attached to said ropes, and all arranged in such a manner as to effect the desired end. The inventor is Charles W. Rawson, Little Prairie Ronde, Mich.

PATENT SERMON EXTINGUISHER.—A sufferer from long sermons suggests to the London *Times* that after half an hour's preaching the bottom of the pulpit should be contrived to come out, on the principle of an *oubliette*, and project the clerical transgressor into the gulf below. Another proposes that a sounding board or cover, in the shape of an extinguisher made exactly to fit the pulpit, be suspended above it, and that at the expiration of twenty-five minutes from the delivery of the text it should begin to descend so as exactly at the half hour to " shut up " the lengthy preacher.

UTAH COTTON.—The *Deseret News* states that a cotton mill has been built at Parowan, in that Territory, and some of the machinery has been put in and is now running. A considerable quantity of cotton is raised in southern Utah, and it is for its manufacture into cloth that this new factory has been constructed.

AN extensive new lode of cinnabar has lately been discovered in the Nevada Territory. Specimens of the ore contain about sixty per cent of quicksilver.

ISSUED FROM THE UNITED STATES PATENT OFFICE.

FOR THE WEEK ENDING JUNE 17, 1862.

Reported Officially for the Scientific American.

*** Pamphlets giving full particulars of the mode of applying for patents, under the new law which went into force March 2, 1861, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

35,576.—W. V. Adams, of New York City, for Improvement in Shackles or Hand Cuffs :

I claim the combination of the hasp, B, with the sections, A and B, for the purpose of allowing to each one of a pair of shackles a motion independent of the other when in use, as described.

35,577.—W. D. Andrews, of New York City, for Improved Reciprocating Pump :

I claim the compound piston, or one formed of two parts, D D′, each provided with a valve, E, in combination with the partition or abutment, B, in the pump cylinder, A, the water passage, F, and the induction and eduction openings, H G, when arranged to operate as and for the purpose set forth.

35,578.—S. L. Avery, of Norwich, N. Y., for Improvement in Water Elevators :

I claim the annular outer flanch, a, and the interior ratchet wheel, b, which respectively project from the outer face of the metallic head, E, of the windlass shaft, when the said parts have substantially the proportions, and are used in the manner and for the purpose set forth.

I also claim the jointing of the branched crank lever, F, with the movable head, D, when the said head is combined with the rigidly secured head, E, of the windlass shaft, in such a manner that the ratchet tooth, c, on the branch arm, k, of said crank lever, can be made to operate in conjunction either with the ratchet wheel, b, or the annular flange, a, of the aforesaid head, in the manner set forth.

I also claim the arrangement of the forked holder, g, the spring, h, and the branch arm, j, of the jointed crank lever, F, with each other, and with the head, D, and the annular groove near the end of the windlass shaft, substantially in the manner and for the purpose set forth.

I also claim the arrangement of the hook headed pall, n, with the metallic head, D, when the said head is jointed to the branched crank lever, F, and when these said parts are combined with the head, E, of the windlass shaft, substantially in the manner set forth.

35,579.—Henry Behn, of New York City, for Improvement in Coal-Oil Lamp :

I claim the arrangement of the gas chamber, d, between the upper and lower wick tubes, n and b, in combination with the tubes or pipes, m m, in the manner and for the purpose substantially as described.

Secondly, I claim the construction of the upper end of the gas chamber, d, forming the upper wick tube, n, provided with a wedge, p, or its equivalent, in the manner and for the purpose specified.

35,580.—Ebenezer Bickford, of Ogden, N. Y., for Improvement in Apparatus in Smoking Meats :

I claim, in combination with the smoke house, A, the conducting and distributing pipe, L, provided with an opening, d, or its equivalent, extending nearly or quite its whole length, when the same is used to convey and distribute the smoke from an outer stove or generator, substantially as described.

35,581.—Jacob Bickhart, of Harlan, Ind., for Improvement in Portable Fences :

I claim the arrangement of the wedge, d, gib, e, and hooked cross brace, D, in combination with the braces, C C′, and notches, a a′, in the upper ends of posts, B B′, all constructed and operating substantially in the manner and for the purpose shown and described.

[This invention consists in the arrangement of braces with shaped edges, catching into corresponding notches in the edges of the posts near to those upper ends, in combination with a crossbrace, the ends of which form hooks and catch over the lower edges of said crossbraces, and with a wedge and semicircular gib, in such a manner that by the action of the crossbrace or the lower ends of the braces the upper ends of the posts are held together, and by the action of the semicircular gib and wedge, which forces the crossbrace down, the lower ends of the posts are prevented speedily.]

35,582.—S. J. Reeves, of Philadelphia, Pa., for Improvement in the Construction of Columns, Shafts, Braces, &c.

I claim uniting together, three or more pieces of wrought iron made with flanges, in the direction of their length, so that they shall form a column or shaft to be used as posts and also as braces or compression chords, in the construction of buildings, bridges, piers or other structures.

35,583.—Henry Bogel, of Watertown, Wis., for Improvement in Velocipede Vehicle :

I claim, first, The arrangement and combination of the treadles, N N, levers and handles, O O Q Q, and crank axles, A B, in connection with the semicircular rack bar, F, and wheel, G, all arranged for joint operation as and for the purpose set forth.

Second, The clamps or levers, S S, and spring, T, in connection with the bar, R, on the shaft, H, arranged substantially as shown, to prevent the casual turning of the front axle, A, as specified.

Third, The hollow, U, provided with the whistle, V, when used in combination with the treadles, N N, and levers, Q Q, and operated by the crank axle, B, substantially as and for the purpose set forth.

35,584.—C. H. Brown, of Fitchburg, Mass., for Improvement in Feed Regulators for Steam Boilers :

I claim, first, Having both of the levers, E F, jointed separately to the expanding pipe, A, said joints being arranged upon opposite sides of said pipes, in combination with the fulcrum, D, and the link, G, as and for the purpose shown and described.

Second, The employment of the cold water reservoir, I, in combination with the expanding pipe, A, and lever, F, substantially as and for the purpose shown and described.

35,585.—A. Buckwalter, H. Buckwalter and J. H. Buckwalter, of Kimberton, Pa., for Improvement in Brick Machines :

We claim, first, The feeding bar, G, provided with the rack, i, and having the weight, M, attached, in combination with the pinion, H and toggle, K, all arranged as and for the purpose specified.

Second, The drops, V, arranged as shown, to yield or give to obstructions in the molds as the latter are forced out from underneath the box or hopper, as described.

Third, The reciprocating planer, Z, provided with the adjustable plates or scrapers, b′ b′, to operate as set forth.

Fourth, In combination with the plates, b′ b′, the cleaners, A″ A″, arranged as shown to operate as and for the purpose specified.

Fifth, The water tank, E′, and trough, H′, the former being connected with the latter by an elastic tube, G′, and the trough, H′, provided with pipes, K′, all arranged as shown, to operate in connection with the reciprocating planer, Z, for the purpose set forth.

[This invention seemingly possesses many advantanges over the ordinary brick machines in use. It operates rapidly and performs its work in the most efficient manner.]

35,586.—C. B. Cogswell, of Essex, Mass., for Improvement in Horse Rakes :

I claim the arrangement and combination of the journal slides, C C,

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the intermediate hangers, E E, and the lever, F, and its catching mechanism, G, with the carriage and the revolving rake, the whole being so as to enable the rake head to operate substantially as specified.

35,587.—A. B. Cooley, of Philadelphia, Pa., for Improvement in Mode of Discharging Projectiles:

I claim the solid cylinder, b, adapted to fit into the shot or shell, A, and combined with the shield, d, substantially as and for the purpose set forth.

35,588.—John Copeland and G. P. Martin, of Quasqueton, Iowa, for Improvement in Churns:

We claim, first, The arrangement of oblique scoops, G, on the inner surfaces of the sides of a prismatical rotary tub, A, constructed and operating substantially as and for the purposes described.

Second, The T-shaped air tube, H, passing through one of the trunnions, C, of the rotary tub, A, in combination with the spring, c, and packing ring, d, constructed and operating substantially as and for the purpose specified.

[This invention consists in the arrangement of inclosed scoops on the inner surfaces of the sides of a rotary polygonal tub, in such a manner, that by the action of said scoops the cream is carried up and thrown alternately against the leads or ends of the tub, whereby butter is made in a short time, and with comparatively little labor.]

35,589.—J. M. Dillon, of Wheeling, Va., for Improved Centrifugal Governor:

I claim the governor composed of the revolving chambers, B D D, connected by hollow arms, C C, and the diaphragm, E, or its equivalent, the whole combined and applied in connection with the regulating valve, substantially as specified.

[This governor is composed of a central chamber secured to, and surrounding a concentric vertical rotating shaft, deriving motion from the engine or other motor, and having attached to it by hollow arms other chambers arranged at convenient and suitable distances from the said shaft, such chambers containing mercury which is caused by the centrifugal force developed in the chambers by their revolution with the shaft, to be driven in greater or less quantity from the central into the other chambers according to the velocity of their revolution, and the said central chamber having arranged within it, above the mercury, a float or flexible diaphragm which is caused to fall and rise with the mercury in the said chamber, and so, by means of suitable connections, to operate upon the regulating valve of the engine or motor, in such a manner, as to give it a less or greater opening, according as more or less mercury is expelled from the said chamber by the less or greater centrifugal force due to a greater or less velocity of revolution, and so to regulate the speed of the engine.]

35,590.—W. W. Dingee and A. B. Farquhar, of York, Pa., for Improvement in Grain Separators:

We claim securing the drum of the fan in its proper position by grooves, C C, cast in perforated side plates, A.

We also claim connecting the movable plates, E, by the rod, G, on the outside of the fan.

We also claim the combination of the trough, O, screen, N, and trunk, S, with the revolving block strap, R, when made and operated as set forth.

We also claim bag holder, L, when made as described.

35,591.—William Donnan, of Burgettstown, Pa., for Improvement in Stock Gates for Water Courses:

I claim the arrangement of a raked-shaped gate, with its head piece close to the bottom of the brook and operated on by means of the lever, e, and spring, m, or weight, w, inside of the metal box, f, or wooden box, b, substantially as and for the purposes set forth.

35,592.—Andrew Dougherty, of Brooklyn, N. Y., for Paper Cutting Machine:

I claim the combination of the mechanism for cutting the paper, with the feed rollers (for delivering it to be cut), by means of cam-formed cog wheels, substantially as set forth.

I also claim the combination of the mechanism for cutting the paper, the feed rollers, the cam formed cog wheels, and an intermittent clamp, substantially at set forth.

I also claim the combination of the knives of a paper cutting machine, with a bellows for producing a blast of air to detach the paper from the knives, substantially as set forth.

35,593.—J. J. Dresbach, of Circleville, Ohio, for Improvement in the Exploding device of Shells:

I claim in combination with an exploding projectile, a plunger tube, E, having a tapered portion, E', and a conical spring plunger, H, working therein, substantially in the manner and for the purpose set forth.

35,594.—Lemuel Ensign, of Millburn, N. Y., for Improvement in Fanning Mills:

I claim the arrangement and combination of the riddle, R''', plate, p, and spring hammer. s, substantially as and for the purposes set forth.

35,595.—J. A. Fanshawe and J. A. Jaques, of Tottenham, England, for Improved Steam Generator. Patented in England, October 31, 1861:

We claim the constructing of steam boilers with a series of distinct narrow water spaces or compartments, combined together side by side, and having provided between them convolute, curved or serpentine flues or fire and gas passages, substantially as specified.

[This invention, the nature of which is explained by the claim, makes a boiler which seems to be well adapted for the rapid generation of steam, and to economize fuel.]

35,596.—G. P. Farmer, of Philadelphia, Pa., for Improvement in Envelopes for Sewing Needles:

I claim the holder, B, and wrapper, A, when constructed and arranged for holding the needles, and folding over and inclosing the same, substantially as and for the purpose set forth.

35,597.—Lyman Fay, of Fall River, Mass., for Improvement in Mode of Securing Railroad Joints:

I claim the method substantially as above described, of securing the fish pieces, A B, which overlap and confine the joint, a, of two railroad rails, viz., the box, F, and follower, G, with the elastic packing, H, and the bolts, E, passing through them.

35,598.—W. L. Fish, of Newark, N. J., for Improved Attachment to Lamp Chimneys:

I claim, first, A lamp chimney, A, provided with a receiver, B, substantially as and for the purpose shown and described.

Second, The arrangement of the window, e, in the metal bulb, a, of a chimney, A, as and for the purpose set forth.

35,599.—Oscar Falke, of New York City, for Improved Hard Rubber Compound:

I claim the above described improved hard vulcanite as a new article of manufacture when the same is made, substantially in the manner and for the purposes set forth.

35,600.—C. M. French and W. H. Fancher, of Waterloo, N. Y., for Improvement in Combined Plow and Gun:

We claim the combined implement described, consisting of the hollow or tubular ordnance beam, D, combined with the parts, B C and A, of a plow, substantially as and for the two-fold purposes set forth.

35,601.—Daniel Fobes, of Boston, and H. M. Hartshorn, of Mass., for Improvement in Fire Ladder Apparatus:

We claim the combination of mechanism employed in elevating the ladder sections, the same consisting of the endless chain or band, F, the lifter tooth, L, the pawl, p, the tooth shoulder, k2, and the pawl notch, q, or mechanical equivalent, applied to the main ladder and each section, and operating therewith, substantially as specified.

We also claim the combination of the movable hooked window breaker, L', and its operating lines or chains with the extension ladder, the same being to operate in manner and for the purpose with respect to such ladder, as specified.

35,602.—C. L. Frink, of Rockville, Conn., for Improvement in Weavers' Shuttles:

I claim as a new article of manufacture, a shuttle provided at its ends with shanked metal tips, B, and metallic ferrules, D, the latter fitting within annular cavities, C, beneath the surface of the wood, and all constructed, combined and arranged in the manner and for the objects set forth.

35,603.—M. A. Genung, of Granville, Ohio, for Improved Door Bell and Burglar's Alarm:

First, I claim the combination of the said attachment on the jam of the door and the pin, connected with the alarm of the bell, substantially as and for the purposes specified.

Second. I claim the arrangement of the springs, B C, in connection with lever, A, and shaft, C, by which the lever, D, and lever, E, are caused to operate on the shaft, F, in such a manner as to cause the hammer, I, to operate on the bell, J, substantially as specified.

Third, I also claim the bridge hinge, Q, by which the bell is supported and opened to wind up the alarm, substantially as specified.

Fourth, I claim the perforated band, Y, encircling the base and bell rim as a protection, as specified.

35,604.—W. H. Guild. of Brooklyn, N. Y., for Improvement in Rotary Pumps:

I claim the wheel, G, composed of a series of spiral arms or flanches, g, connected with a rim, f, in combination with the cylindrical case, A, having two different diameters to form a shoulder or bearing, b, for the wheel which, with its shaft, E, is fitted within said case, substantially as and for the purpose set forth.

[This invention consists in the employment or use of a wheel provider, with spiral flanches or arms, and fitted on a horizontal shaft which is placed within a cylindrical case, and, with the wheel, arranged in such a manner that both will have a proper bearing and suitable provision allowed for wear, so that the wheel will rotate without any loss from back action or leakage, and a very efficient, simple and economical pump obtained, one capable of lifting and forcing the water, and operating without the liability of becoming choked or clogged by substances which may be held in suspension in the water, or drawn up with it.]

35,605.—C. C. Harrison and Jos. Schnitzer, of New York City, for Lens for Photographic Cameras:

We claim the combination of two sets of cemented lenses, as represented in the accompanying drawings, the exterior surfaces of which shall form part of the same sphere, the axes of which shall be coincident, and the other curves of which shall be so proportioned to the focal distance of the combination, and to the refractive and dispersive powers of the glass used in their construction, that the image found at the focus shall be achromatic, and that said image shall be upon or almost exactly upon a plane without distortion of form, and including a larger visual angle, substantially as before described and represented.

[This invention consists in combining two sets of lenses of such a form, and in such a manner, that both combined constitute a portion of a perfect sphere whereby a lens is obtained of a short focus which will admit of rays at an angle of 90 degrees or nearly so, and which will produce a more distinct picture than lenses of the ordinary construction.]

35,606.—W. E. Hatfield, of Newark, N. J., for Improvement in Odor Traps for Sinks, &c.:

I claim the odor trap having a valve at such an acute angle as to require but slight pressure to close or open it, when constructed substantially in the manner and for the purpose specified.

35,607.—R. T. Hathaway, of New Bedford, Mass., for Improvement in Raising and Transporting Stone:

I claim the combination of the bent wheel arms or axles, n n, and bars, r r, with the side pieces, m m, struts, k k, plates, s s, and clips, D D, in the manner and for the purpose shown and described.

The arrangement together of the lifting shaft, E, and its gear wheels, in the center of the framing, f f w w k k, as shown and described, so that the gearing and the weight to be lifted will always be evenly balanced upon the wheels, as set forth.

[The object of this invention is to obtain a machine by which stones may be raised from the earth and transported from place to place with great facility, and at the same time be perfectly strong and durable so as to resist the great strain to which it may be subjected in raising the stones, and to sustain them when raised.]

35,608.—Samuel Haller, of New York City, for Improvement in Attaching Straps to Pantaloons:

I claim the described mode of constructing and attaching pantaloons and pantaloon straps, the same consisting in the employment of the parts, B C and D E, or their respective equivalents, arranged to operate together in the manner set forth.

35,609.—Remi Henry, of Morrisania, N. Y., for Improvement in Pumps:

I claim the arrangement of the partitions, c c, with the cylinder, B, pipes, a b, and the shell, A, in the manner shown and described.

[This invention consists in constructing the pump, in such a manner, that the cylinder and shell may be cast in one piece, and the cylinder be so exposed that it may be bored with facility, and made perfectly true to receive the piston, and at the same time have such a position in the shell, and be so connected therewith, that water passages will be obtained incompassing the cylinder of sufficient capacity to amply supply the same when the piston is operated at a very quick speed.]

35,610.—L. L. Hill, of Hudson, N. Y., for Improvement in Making Illuminating Gas:

I claim the combination of wood gas, the hydrogen of water, and the gas of paraffine oil, or the same combination with any other oil gas, or the gas obtained from bituminous coal, when effected in the manner substantially as described.

And I claim the methods described for producing and uniting the same with a view to convenience, efficiency and economy.

35,611.—B. B. Hotchkiss, of Sharon, Conn., for Improvement in Concussion Fuse for Explosive Shells:

I claim the plug, E, and wire, J, or their respective equivalents, arranged to operate in the percussive mechanism of explosive projectiles, substantially as set forth.

35,612.—J. B. Johnson, of Lynn, Mass., for Improvement in Warming Passenger Cars:

I claim the arrangement of a stove or heating apparatus within the doorway of a carriage, as described.

I also claim the construction of the heating apparatus with the tongue and groove, or their mechanical equivalent, arranged on opposite sides or edges of it, and so as to enter the door frame and receive the door of the carriage, when such heating apparatus is arranged within the doorway of such carriage, as set forth.

I also claim the arrangement of the auxiliary pipe, I, relatively to the driver's platform or in the projecting roof thereof, as explained, when the heating apparatus is arranged in the doorway, as set forth.

35,613.—G. A. Keene, of Newburyport, Mass., for Improvement in Pendent Measuring Funnels:

I claim attaching a pendent tunnel measure to a cask faucet by means of a rubber or other flexible tube, D, substantially as described and for the objects specified.

35,614.—M. M. Latta, of Goshen, Ind., for Improvement in Surgical Splints:

I claim, first, Applying the counter extension to the splint instead of to the person, substantially as set forth.

Second, Applying the principal dressing to the sound limb, substantially as set forth.

Third, The use of a spring and index, or equivalent devices, substantially as described, to show the amount of extending force applied.

Fourth, Attaching the cross bar, D, to the long splint, A, by springs, B B, which permit the descent of the cross bar, retain the splint in correct position, and equalize the tension upon both ends of the bar, so as to cause it to slide freely on the shaft, F.

Fifth, Supporting the cross bar, D, upon a truck frame, substantially as described, to adapt it to move without obstruction.

Sixth, The combination of the graduated crutch, P, extension devices, L N O, spring, J, and index, i, for the purpose of measuring the relative length of a healed and an uninjured limb, as explained.

Seventh, In combination with a foot board, M, rigidly secured to the cross bar, D, I claim the application of the extension to the foot independently of the said foot board, substantially as and for the purposes described.

35,615.—W. A. Lighthall, of New York City, for Improved Circulator for Steam Engines:

I claim the combination of the propeller or vane wheel, F, with the refrigerator or condenser, A, supply pipe, B, and delivery pipe, C, arranged and operated as and for the purpose set forth.

35,616.—G. McKown, of Altona, Ill., for Improvement in Machines for Upsetting Tires:

I claim, first, The taper keys, J M, when fitted in taper oblique slots, I L, for the purpose of enabling them to sink into the tire under the action of the slide, G, as described.

Second, The loop, O, and bar, P, constructed and arranged as shown, for the purpose of forming a bearing or support for the heated portion of the tire, as specified.

Third, The combination of the toggle, D, with slide, G, attached, the stationary bar, K, jaws, H N, the oblique slots, I L, keys, J M, and the bearing or support formed of the loop, O, and bar, P, all arranged for joint operation, as and for the purposes set forth.

35,617.—Porches Miles, of Hartford, Conn., for Improvement in Sash Locks:

I claim the swinging lever, B, in combination with the cam, D, with its arm, D', and the spring, d, or its equivalent, and the key, E, the whole constructed and operating as described, for the purpose set forth.

I also claim forming on the pivot end of the arm, B, an eccentric hub, i, in combination with the arm, D', of the spring cam, D, for retaining the vibrating arm within the case, A, as described.

I also claim the combination of an eccentric clamping dog or double cam piece, c, or its equivalent, with the vibrating spring actuated lever or arm, B, substantially as and for the purpose set forth.

35,618.—John Mix, of West Cheshire, Conn., for Improvement in Securing Bits in Braces:

I claim the cylindrical shank, D, provided with plane surfaces, a c, as shown, in connection with the stop or bearing, E, and the set screw, F, all arranged substantially as and for the purpose set forth.

[The object of this invention is to secure bits with cylindrical shanks, braces or mandrels, in such a manner that they will be firmly secured therein, and still be capable of being very readily adjusted in the braces or mandrels, and very readily detached therefrom, and thereby not only effect a great saving in the manufacture of the bits, but also insure a more perfect or truer adjustment of the bit in the brace or mandrel.]

35,619.—Charles Morrill, of New York City, for Improvement in Breech-Loading Ordnance:

I claim, first, The combination of the eccentric, E, the sliding box, C, and the breech-pin, B, or their equivalents, operating substantially as and for the purposes described.

Second, The arrangement of the inclined flanges, N N, and the corresponding grooves, O O, substantially as and for the purposes described

35,620.—A. P. Myers, Isaac Searles and G. W. Spencer, of Prattville, N. Y., for Improvement in Churns:

We claim the combination of the air cells, l, and valves, j, with the dasher, J, and bottom, a, as shown and described.

The arrangement of the movable water receptacle, c, air pipe, D, bellows, E, and pipe, I, with each other and with the chamber B, and churn, A, in the manner shown and described.

35,621.—S. R. Parkhurst, of New York City, for Improvement in Machinery for Cleaning Wool, Cotton, &c.:

I claim, the arrangement of the cylinders, d and e, feed rollers, b and c, and beater, f, substantially as and for the purposes specified.

I also claim the cylinder, h, and beater, i, when combined with the cylinder, d, and beater, f, whereby the cotton, wool or other fiber is exposed on both sides of the bat to the operation of the beaters, as and for the purposes set forth.

35,622.—Chas. H. Platt, of New York City, for Improved Bush for the Sheaves of Tackle Blocks:

I claim a metallic bush, B, for wooden sheaves, A, formed of a square or polygonal part, a, provided with a flanch, b, of circular or other form to admit of the bolts, c, passing through it, substantially as and for the purpose set forth.

[This invention consists in having the greater portion of the bush which is fitted in the wooden sheave, made of square or polygonal form, so as to effectually prevent the turning of the bush within the sheave, without depending on the bolts which bear through the latter to effect that result.]

35,623.—L. W. Pond, of Worcester, Mass., for Improvement in Revolving Firearms:

I claim the combination with a cylinder frame, made in two pieces hinged together at the upper rear angle, of a downward extension, G, of the upper part of the frame below the hinge joint, substantially as and for the purpose specified.

35,624.—George Pratt, of West Roxbury, Mass., for Improvement in Coal Sifters:

I claim, first, The arrangement of the swivel plate, f, projecting from the side of the sieve, D, in combination with the disk or ring, A, and arm, c, constructed and operating as and for the purpose specified.

Second, The arrangement of the ring, A, with flanges, a b, and open space, k, in combination with the handle, E, circular slide, l, stops, n, sieve, D, cover, C, and barrel, B, all constructed and operating as and for the purpose shown and described.

[This invention consists of an oval ring made of cast iron or other suitable material, and provided with a flange projecting on the under side to fit over a barrel, and with another flange on the top, and fitted with a socket on one side to receive a swivel that projects from the under surface of a plate secured to the sieve; the opposite side of the disk being arranged to allow a cast-iron handle secured to the sieve, to move horizontally, said handle being made of such a width, that when it rests on the ring, it will keep in its proper horizontal position the sieve, to which it is fastened.]

35,625.—Samuel Richardson, of Rochester, N. Y., for Improvement in Corn Shellers:

I claim the employment, in corn shellers, of a series of annular sections or divisions, B, which form the outer cylinder, in combination with the primary or inner cylinder, D, they being arranged and operating substantially in the manner specified.

35,626.—E. C. Roberts, of Salem, Mich., for Improved Mode of Preserving Fruit and Vegetables:

I claim the preservation of fruit and vegetables, by the combined action of snow and ice, when placed around the boxes containing the fruit or vegetables, as set forth.

35,627.—H. C. Rogers, of Scranton, Pa., for Improvement in Hoes:

I claim as a new article of manufacture a hoe, A, composed of two plates, a b, one of iron and the other of steel, so united by welding them together that the two metals form the cutting edge, for the purpose set forth.

[This invention consists of a hoe composed of a plate of iron, and plate of steel welded together, in such a manner, that its two metals form a self-cutting edge.]

35,628.—Timothy Rose, of Cortlandville, N. Y., for Improvement in Churns:

I claim the peculiar form and construction of the outer bars or slats of a vertical churn dash, in combination with the middle bars, substantially as described, with the object and for the purpose set forth.

35,629.—Simon Rosenheimer, of New York City, for Improvement in Boots and Shoes:

I claim the combination of the sole of a shoe or boot with a small ridge or partition, substantially in the manner and for the purpose as described.

35,630.—William Rumbold, of St. Louis, Mo., for Improvement in Domes:

I claim a metal dome constructed substantially as described, for the purpose set forth.

35,631.—A. F. Saunders, of Chelsea, Mass., for Improved Clothes Wringer:

I claim the described clothes wringing machine, consisting essen-

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tially of the rolls, B D, the standards, A A', with their movable jaws, F, the spring, H, and regulating screw, G, arranged and operating substantially as described.

[This stove is applicable to all varieties of heating purposes. Its advantages are economy of fuel, large area of heating surface, and protection of the parts from too severe action of the fire.]

35,632.—S. B. Sexton, of Baltimore, Md., for Improvement in Heaters:

I claim, first, The air heating chamber, F, located above the fire pot between the chambers, G G', communicating in front with the interior of the room and at the back with a chamber, l, from which heated air is conducted to apartments above the said parts being arranged to operate in the manner and for the purposes specified.

Second, The employment of the air-heating chamber, F, located as set forth and open both at front and back, as a means of producing a free circulation of air in contact with the top of a covered fuel supply chamber, E, of any suitable construction.

Third, The combination of the chamber, F, stoppered aperture, N, flue, D, and covered opening, e, of the fuel supply chamber, all arranged in the manner and for the purposes specified.

35,633.—Pierpont Seymour, of East Bloomfield, N. Y., for Improvement in Seeding Machines:

I claim the arrangement and combination of the fixed, attaching jaw, B, movable, adjusting jaw, C, and adjustable supporting guide bars, D D D, substantially in the manner and for the purpose specified.

35,634.—Jonathan Smith, of Tiffin, Ohio, for Improvement in Grain Drills:

I claim, first, In combination with the spring, f, and curved neck, S, of the tooth, b, or their equivalents, block, H, placed between the bars, forming drag bar, a, and provided with two or more holes, for the purpose of adjusting the position of drill tooth or boot, b, as and for the purpose set forth.

Second, I claim, in combination with a seed drill boot, held in position or operated by a spring, providing said boot with suitable projections, and such projections with adjusting holes and pin to retain the boot in position when in use, in case said spring should by any means be rendered inoperative, as and for the purposes set forth.

37,635.—William Southworth, of Newcastle, Maine, for Multiplying Camera:

I claim, first, The device for moving the lenses, as described, namely, the raising or lowering the lenses by means of the holder, B, and catches. F.

Second, Moving the lenses from one side for the camera, C, to the other, to stops, s s, by means of the slide, A.

Third, The manner of excluding the light from the sensitive plate by the use of the partitioned box or diaphragm, D.

Fourth, The manner of constructing the same, so that it can be partially drawn out or slid back at pleasure.

35,636.—J. H. Thomas and P. P. Mast, of Springfield, Ohio, for Improvement in Seed Drills:

I claim the plate, B, provided with the projections, c, and loops, g, the whole being cast in one piece, in the manner and for the purpose set forth.

35,637.—W. B. Treadwell, of Albany, N. Y., for Improvement in Breech-Loading Ordnance:

I claim the employment of the gun with concave breech in connection with the convex breech piece, the bail, D, and the projecting pieces, C C, the several parts being constructed and operating in the manner and for the purpose set forth.

35,638.—C. D. Van Allen, of Syracuse, N. Y., for Improvement in Churns:

I claim the combination and arrangement of the floats, B B, the partitions, F F, the regulating slide, C, and the butter tray, H, when used for the purposes specified.

35,639.—G. Frink, of New York City, and L. Heitkamp, of Brooklyn, N. Y., for Machine for Cutting Books in the Round:

We claim a machine for cutting the fronts of books in the round, consisting of a rocking knife suitable for cutting the round or concave of the front edge of the book in combination with a press suitable for holding the book and presenting it to the action of the knife, substantially as described.

Second, We claim, in combination with a press suitable for holding the book, a convex polishing device, substantially as described for the purpose of polishing the fronts of books in the round, as set forth.

Third, We claim, in combination with a press suitable for holding a book, and presenting the front edge to be cut a knife edge moving in the desired curve of the round, having combined with it a polishing surface, substantially as described.

Fourth, We claim, in combination with a press suitable for holding and presenting the front edge of the book to be cut, the endwise motion of the knife and polishing device, whether combined together, or separate from each other, as described, when constructed and arranged to move in the curve necessary to cut and finish the front of the book in the round, substantially as described.

Fifth, We claim, in combination with a press suitable for holding the book, a knife, the cutting edge of which travels in the desired curve of the round, substantially as described.

Sixth, We claim, in combination with a press suitable for holding a book and presenting it to be cut, and a knife having a cutting edge moving in the desired curve of the round, a cutting board, or other suitable surface, for the knife to cut against, substantially as described.

35,640.—W. W. Virdin, of Baltimore, Md., for Improved Rotary Engine:

I claim the chambers, D, when formed partly in the cylindrical case and partly in the drum, and when operating in the manner, substantially as described.

I also claim the peculiar arrangement of the steam passages, a, with respect to the annular or ring steam chest, C, and butments or pistons, l and m, substantially as specified.

I also claim the grooved annular packing ring, f, as and for the purpose set forth.

I also claim the wheel, J, when constructed and operating, substantially as specified.

35,641.—William Vogt, of Louisville, Ky., for Mode of fastening Shirt Studs:

I claim the application of the spring and lever to shirt buttons, composed of two parts, thereby preventing them from getting lost, and facilitating the fixing of them.

35,642.—W. B. Wadman, of Boston, Mass., for Improvement in Coal Sifters:

I claim the arrangement of the square projection, b, on one, and the pivot, a, on the other side of the handle, E, in combination with the square socket, c, in the center of the sieve, F, and with the bridge, D, in the bottom of the barrel, A, as and for the purpose specified.

I also claim the conical cap, d, over the socket in the center of the sieve, E, as and for the purpose described.

35,643.—Sylvenus Walker, of Boston, Mass., for Improved Clothes Wringer:

I claim the frame, A, constructed of two forked side pieces, and provided with curved flanches or guards, d d, and ears or lugs, g g, in combination with the screws, E E, passing through the ears or lugs, f f, of the sockets or bearings, D D, of the upper roller, C, through the ears or lugs, g g, of the frame, A, and through the springs, F F, underneath the ears or lugs, g g, all arranged as and for the purpose specified.

35,644.—Job T. Williams, of Philadelphia, Pa., for Improvement in Lamp Reflectors:

I claim, the reflector, composed of the outer concave rim, a, and central convex projection, b, and having radial ribs or corrugations, the whole being constructed and arranged, as and for the purpose set forth.

35,645.—John E. Wilson, of Baltimore, Md., for Improvement in Apparatus for Defecating Liquids:

I claim, the combination of the reservoir, A, receiver, B, and filter, C, with the suction and discharge pipes, g h, force pump and conducting faucet, j, all arranged and operating in the manner explained, to defecate or cleanse hot or cold liquids, by forcing them in a continuous circuit without contact with the external air.

[This invention consists in a certain construction of apparatus, in which is combined a pump, whereby the liquid may be impelled or forced through any suitable filtering medium in a continuous circuit, without coming in contact with the external air, thus greatly facilitating the operation of defecating or cleansing.]

35,646.—John Zimmerman, of Bloomfield, Pa., for Improvement in Lifting Jacks:

I claim, the two racks, b and c, in combination with the two dogs, g and n, when arranged one on each side of the standard, A, and operating, substantially as described.

I also claim the combination of the two racks, b and c, the two dogs, g and n, the connecting rod, F, and the operating rod, D, as and for the purpose set forth.

35,647.—A. I. Ambler, (assignor to himself, R. N. Ambler and W. Martin), of Milwaukee, Wis., for Improvement in Railroad Car Brakes:

I claim, first, The employment or use of a steam cylinder, applied to a locomotive, and connected with a revolving shaft, M, substantially as shown, when said steam cylinder is used in combination with revolving brake rods, Q, attached to the cars on the trucks thereof, for the purpose set forth.

Second, The employment of bent or angle levers, with friction rollers, to obtain perfect uniformity of pressure, in combination with rods and chains, to connect the braking bars and each other when operated by a tumbling or revolving rod, substantially as shown, and for the purpose set forth.

Third, Actuating the brakes from the rotating rod, Q, through the medium of a crank, V, and spring, m, arranged with a lever, Z, or applied directly to the brakes, so as to operate, substantially as and for the purpose set forth.

Fourth, The jointed shaft. H', provided with the screw, J', sliding spring rod, I', lever, K', or its equivalent, and the worm wheel, i*, on the chain shaft, i*, all arranged as shown, for the purpose specified.

35,648.—E. G. Dyer (assignor to Owens, Lane, Dyer & Co.), of Hamilton, Ohio, for Improvement in Thrashing Machines:

I claim the application to the grain delivery of a thrashing machine, of the winnowing suction spout. E, in combination with the shoe fan; the whole being constructed, adapted and regulated, substantially as set forth.

35,649.—Merwin Fowler (assignor to Edward Miller), of Meriden, Conn., for Improved Spring Catch for Lamp Chimneys:

I claim, the combination of the hook, C, and spring, d, applied to the lamp top, or burner, substantially as and for the purpose set forth.

[This invention consists in securing the chimney to the lamp top by means of a hook, which is attached to the lamp top, and has a spring connected to it and all arranged in such a manner that the hook will, under the action of the spring, press down upon the flanch of the chimney, and firmly secure the latter to the cone of the burner.]

35,650.—Charles Heath, of Malden, and Joseph Wilson, of Boston, Administrators of J. B. Wilson, deceased, late of Malden, Mass., for Improvement in Machinery for Pressing Brick:

We claim the combination of the cranked lever or shaft, K, and the two connecting rods, I I, with the two sectoral toggles, L M, and the crossbar, G, the whole being applied so as to operate with the follower and the discharger of a brick press, substantially as specified.

We also claim, the combination of the spring, H, with the bar, G, the rods, I I, the cranked shaft, K, and the sectoral toggles, L M, when employed for operating the follower or platen of a brick press, as specified.

35,651.—E. C. Hussey (assignor to himself and John Devlin), of Brooklyn, N. Y., for Improvement in Machines for Making Elongated Bullets:

I claim, first, The combination of a straight groove, e, in a stationary flat table or bed, and a corresponding groove in a straight reciprocating bar or slide, such groove having a suitable form, and operating to roll the blanks of lead into shape, by a movement about their own axes, substantially as specified.

Second, The combination with the grooved reciprocating bar or slide, C, and the grooved stationary table or bed, A, of a cutter, c, applied and operating in connection with the grooves of the bar and slide, and table or bed, substantially as set forth.

Third, The combination with a bar or slide, C, a table or bed, A, and cutter. c, operating as described, of a feed bar, E, and an elastic feed lever, D, applied and operating, substantially as and for the purpose specified.

Fourth, The combination with the grooved table or bed, A, and the grooved bar or slide, C, of one or more pairs of holding dies, and a corresponding number of drills applied to receive the rolled bullets from the said grooves, and drill the cavities in their bases, substantially as specified.

Fifth, The dies, F G, constructed, combined, applied and operated, substantially as and for the purpose specified.

Sixth, Combining the die carriages, H H, with the reciprocating feed bar, E, by means of grooves, q q, and switches, J J, substantially as and for the purpose set forth.

[This invention consists in a machine of novel character, in which cylindrical blanks are cut from rods of lead, then brought to the desired external form for the bullets by a rolling process, and afterward drilled to produce the cavities in their bases.]

35,652.—I. S. and J. W. Hyatt, Jr., of Chicago, Ill., assignors to said I. S. Hyatt and Oliver Bascom, of Whitehall, N. Y., for Improvement in Knife and Scissors Sharpeners:

We claim, first, The combination and arrangement of the double rest, d d', and grinding wheel, C, substantially as and for the purpose specified.

Second, We claim the combination of the scissors rest, D, either double or single, with the twin grinding wheels, C C', kept in contact by a spring or its equivlaent, the whole forming a machine for sharpening both scissors and knives, substantially as described.

35,653.—J. H. Mears (assignor to himself and Alfred Ward), of Oshkosh, Wis., for Improvement in Rakes for Harvesters:

I claim, first, The wheel, H, constructed with an upright rim, having slots, substantially as and for the purposes set forth, in combination with wheels, C c, sleeve, D, spindle, V, caps B and R, posts or springs, U and W, and rake N, all constructed and arranged, substantially as set forth.

Second, I claim the caps, B and R, or their mechanical equivalent, attached to the sleeve, D, of bevel wheel, C, turning in a contrary direction from wheel, H, constructed and operating in combination with rake, N, substantially as and for the purposes set forth.

Third, I claim the mechanical arrangement of rake N, with its ring or short sleeve, L, with gear wheels, H and C, and their attachments, whereby one wheel causes the rake to move toward the reel in an elevated state, and the other in a contrary direction, causing it to sweep in close contact with the platform, substantially as set forth.

35,654.—J. E. Seavey (assignor to himself and Matthew E. Bochner), of Kennebunkport, Me., for Improved Sail Link to Mast Hoop:

I claim the mast hoop and sail connection, consisting of the shackle, the bolt, and the clasp, constructed, arranged and combined together, substantially in manner, and so as to operate as specified.

35,655.—Charles C. Stansell, of Middleboro', Mass., assignor to himself and A. W. Rockwood, of Newton, Mass., for Improvement in Lamps:

I claim combining and arranging with the wick the wick tube, B, and the flame adjuster, H, of a lamp, in manner substantially as described, a vapor intercepter, F, and conduit or passage, G, the same being substantially as and for the purpose above explained.

I also claim combining and arranging with the flame adjuster and the vapor interceptor and conduit, as described, a heat insulator or insulating vapor reservoir, I, made of a material and so as to operate in manner, and for the purpose, substantially as specified.

35,656.—J. C. Tobias, of Middleport, Ill., assignor to himself and Henry C. Kirk, of White County, Ind., for Improvement in Harness Saddles:

I claim, as an improved article of manufacture, a harness saddle or pad-tree, composed of plates, A B, pad C, and cover, f, made and united in the manner shown and described.

[The object of this invention is to obtain a saddle or padtree for harnesses that will be extremely simple in construction, and still be capable of yielding or giving to the movement of the animal, as well as adjusting itself to the shape or form of the same.]

35,657.—John H. Vickers (assignor to Lucius W. Pond,) of Worcester, Mass., for Improvement in Revolving Fire Arms:

I claim the continuous cylinder frame, A, rigidly attached to the barrel, and combined with the breech piece, D, to fold into a groove, provided therein for its reception, substantially as and for the purpose specified.

I also claim bringing the lower front angle of said continuous frame, A, to a portion, C, of the stock frame which projects forward from the bottom of the breech piece, D, substantially as specified.

And I further claim the insertion of the cylinder axis pin, in a forward direction, through the cylinder frame and cylinder, and into a hole in the center of the breech piece, substantially as and for the purpose specified.

35,658.—S. R. Going (assignor to D. S. Quimby and D. S. Quimby, Jr.), of Brooklyn, N. Y., for Improvement in Stoves:

I claim, first, The manner of equalizing the heat of the fire in and around the oven, by means of a damper, as set forth.

Second, Placing the damper, B, in the flue in the position shown.

35,659.—Alfred Berney, of Jersey City, N. J., for Improved Composition for filling Shrapnel and other similar projectiles:

I claim asphaltum for the purpose of filling shells, substantially as set forth and described.

RE-ISSUES.

1,317.—G. G. Lobdell, of Wilmington, Del., for Improvement in Cast Metal Car Wheels. Patented April 15, 1862:

I claim, first, A hollow cast metal tire, or hollow rim, B, provided internally with radial braces, f, connected at their ends respectively with the inner and outer peripheries of the tire, and without being in contact with its sides, substantially as and for the purpose set forth.

Second, Securing the tire or rim, B, to the rim, c, of the wheel, A, by means of the bolts, g, passing through the rim, c, and the inner periphery of the tire or rim, B, and having holes, j, made in the sides of the tire or rim, B, to turn the nuts, i, as set forth.

Third, Counterbalancing the wheel by pouring melted lead or other suitable metal into the chamber, e, when said metal counterbalance is used or employed with the braces, f, arranged as set forth.

Fourth, The combination of the hollow wheel, A, and the hollow tire, B, when both are constructed, arranged and secured together, as and for the purpose set forth.

[A notice of this invention appeared in Volume VI. No. 18, of the SCIENTIFIC AMERICAN, New Series.]

1,318.—Henry A. Burr, of New York City, assignee through Mesne Assignments of H. A. Wells, deceased, for Improvement in Manufacturing Hat Bodies. Patented April 25, 1846. Re-issued October 7, 1856. Extended, and again Re-issued April 25, 1860:

I Claim, first, In depositing fur in a conical bat of the described varying thickness.

Second, In holding the bat by pressure, so as to preserve the disposition of the fur and permit the percolation of water, and

Third, In saturating the bat with water while the disposition of the fibers is preserved. These three steps being performed in the order, and substantially in the manner specified.

DESIGNS.

1,605.—W. L. McDowell, of Philadelphia, Pa., for Design for a Stove.

1,606.—W. L. McDowell, of Philadelphia, Pa., for Design for a Stove.

1,607.—John Martino and James Horton, of Philadelphia, Pa., assignors to Stuart and Peterson, for Design for a Cook's Stove.

1,608.—G. B. Owen, of New York City, for Design for a Clock Case.

1,609.—J. F. Rathbone, of Albany, N. Y., for Design for a Cook's Stove.

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Models are required to accompany applications for Patents under the new law, the same as formerly, except on design patents when two good drawings are all that is required to accompany the petition, specification and oath, except the government fee.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and inclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

NEW PAMPHLETS IN GERMAN.—We have just issued a revised edition of our pamphlet of *Instructions to Inventors*, containing a digest of the fees required under the new Patent Law, &c., printed in the German language, which persons can have gratis upon application at this office. Address MUNN & CO.,
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THE CHEAPEST MODE OF INTRODUCING INVENTIONS.

INVENTORS AND CONSTRUCTORS OF NEW AN useful Contrivances or Machines, of whatever kind, can have their Inventions illustrated and described in the columns of the SCIENTIFIC AMERICAN on payment of a reasonable charge for the engraving.

No charge is made for the publication, and the cuts are furnished to the party for whom they are executed as soon as they have been used. We wish it understood, however, that no secondhand or poor engravings, such as patentees often get executed by inexperienced artists for printing circulars and handbills from, can be admitted into these pages. We also reserve the right to accept or reject such subjects as are presented for publication. And it is not our desire to receive orders for engraving and publishing any but good Inventions or Machines, and such as do not meet our approbation in this respect, we shall decline to publish.

For further particulars, address—

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PATENTS FOR SEVENTEEN YEARS.

The new Patent Laws enacted by Congress on the 2d of March, 1861, are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The duration of patents granted under the new act is prolonged to SEVENTEEN years, and the government fee required on filing an application for a patent is reduced from **$30** down to **$15**. Other changes in the fees are also made as follows :—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
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The law abolishes discrimination in fees required of foreigners, excepting reference to such countries as discriminate against citizens of the United States—thus allowing English, French, Belgian, Austrian Russian, Spanish, and all other foreigners except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms.

During the last sixteen years, the business of procuring Patents for new inventions in the United States and all foreign countries has been conducted by Messrs. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN ; and as an evidence of the confidence reposed in our Agency by the Inventors throughout the country, we would state that we have acted as agents for more than FIFTEEN THOUSAND Inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of Inventors and Patentees at home and abroad. Thousands of Inventors for whom we have taken out Patents have addressed to us most flattering testimonials for the services we have rendered them, and the wealth which has inured to the Inventors whose Patents were secured through this Office, and afterward illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! We would state that we never had a more efficient corps of Draughtsmen and Specification Writers than are employed at present in our extensive Offices, and we are prepared to attend to Patent business of all kinds in the quickest time and on the most liberal terms.

The Examination of Inventions.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a reply written corresponding with the facts, free of charge. Address MUNN & CO., No. 37 Park-row, New York.

Preliminary Examinations at the Patent Office.

The advice we render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there, but is an opinion based upon what knowledge we may acquire of a similar invention from the records in our Home Office. But for a fee of $5, accompanied with a model or drawing and description, we have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a Patent &c., made up and mailed to the Inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through our Branch Office, corner of F and Seventh-streets, Washington, by experienced and competent persons. More than 5,000 such examinations have been made through this office during the past three years. Address MUNN & CO., No. 37 Park-row, N. Y.

How to Make an Application for a Patent.

Every applicant for a Patent must furnish a model of his invention. If susceptible of one; or if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the government fees by express. The express charge should be prepaid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by draft on New York, payable to the order of Munn & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & Co., No. 37 Park-row, New York.

Caveats.

Persons desiring to file a Caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention The government fee for a Caveat, under the new law, is $10. A pamphlet of advice regarding applications for Patents and Caveats, in English and German, furnished gratis on application by mail. Address MUNN & CO., No. 37 Park-row, New York.

Foreign Patents.

We are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business, we have offices at Nos. 66 Chancery-lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does not limit the issue of Patents to Inventors. Any one can take out a Patent there.

Circulars of information concerning the proper course to be pursued in obtaining Patents in foreign countries through our Agency, the requirements of different Patent Offices, &c., may be had gratis upon application at our principal office, No. 37 Park-row, New York, or either of our Branch Offices

Rejected Applications.

We are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted are invited to correspond with us on the subject, giving a brief history of the case, inclosing the official letters, &c.

Assignments of Patents.

The assignment of Patents, and agreements between Patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park-row, New York.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with Patent property or inventions to call at our extensive offices, No. 37 Park-row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid), should be addressed to MUNN & CO., No. 37 Park-row, New York.

Notes and Queries

S. W., of Ill.--We understand that the rifles used by Berdan's sharp shooters, were made by Mr. James, the well-known rifle maker at Utica, N. Y.

C. H. R., of Iowa.—A patent could not be obtained for the use of cast iron in the manufacture of slabs and monuments for grave stones. The idea has been frequently suggested to us.

G. W. M., of Pa.—Nature has provided many ways for scattering the seeds of plants, and among them is the attachment to each seed of certain plants, of a wing or fiber by which they may be wafted by the wind. This is called by botanists the ala. The great value of the ala of the cotton plant is due to its extraordinary strength. Since the discussion of providing some substitute for cotton, we have received specimens of the ala of many plants, but all deficient in the essential quality of strength. The sample that you send is from the cotton wood, or *populus canadensis*, and the fiber is as weak as any that we have ever seen.

P. S., of Ind.—No newspapers hold themselves responsible for the assertions of advertisers.

J. P., of Wis.—It seems to us a very poor time to advocate universal peace. Wait till the nations are somewhat wearied with war.

J. K., of Del.—A stand of arms consists of a musket with the usual appendages, bayonet, cartridge box, &c.

B. T., of R. I.—Some bomb shells burst into a hundred pieces, while others break into but few.

A. L. L., of Va.—The American Rifle was formerly sold by Messrs. Appleton and Co. of this city. If you cannot procure it of them we know not where it can be obtained.

J. M. H., of N. Y.—We do not know of any parties engaged in the mackerel fishery, but we presume you could ascertain by addressing the post-master at Gloucester, Mass. We copied the paragraph to which you allude from some Eastern paper, without knowing anything personally about the facts.

J. A. C., of C. W.—An electro-magnet, if its iron is very pure and soft, will not retain one-fourth of its induced magnetism after the circuit is broken. A counter current of electricity in a coil, if it is of sufficient power, will nullify the induced magnetism of a magnet.

F. A. H., of D. C.—Do not use tar for cementing the bottom of your aquarium. Pitch is about the best substance you can use. Allow it to stand for several days full of water, then remove the old and put in clean water before you put in your fish, &c.

L. J., of Mass.—There is no published work on cotton manufactures and cotton machinery, which comes up to the practice of the present day.

D. B. D., of Iowa.—Various remedies have been recommended for the bite of rattle snakes, but we cannot personally indorse the virtue of any one of them. In Ceylon and the East Indies, where the venom of serpents is very fatal, incision and cutting out of the affected part and the application of a hot iron to it, is considered the only probable safe mode of treating snake wounds. In various parts of our own country, persons who are bitten by snakes are treated with copious supplies of whisky until they become drunk, and at the same time an infusion of tobacco and whisky is applied to the wounds. In many cases this treatment is said to be successful. An infusion of snake root taken inwardly, and also applied to the wound, is said to be a cure for the bite of copper heads and rattle snakes.

J. R. G., of Ky.—An enamel of porcelain on large iron sugar rollers, would prevent the cane juice from acting on the metal, but it would perhaps cost too much for your purpose to enamel the rollers you intend to use for crushing cane. We are not acquainted with any cheap cement that will answer the same purpose.

W. H. G., of N. Y.—Modern steel is neither inferior in strength, tenacity, nor temper to ancient steel. It is a well-known fact, however, that steel improves in ductility by keeping it lying in a fixed position for a year or two after it is made. Damascus steel has a high reputation, but it is somewhat scarce. Hussey, Wells & Co., of Pittsburgh, Pa., manufacture good steel, but most of the first quality used by our manufacturers of cutlery, is made in Sheffield, England.

H. G., of Pa.—The pressure of the atmosphere is about 15 lbs. to the square inch. If you compress into a vessel of the capacity of 12 cubic feet, a quantity of air which would be equal to 36 cubic feet, under the ordinary pressure, its pressure, after being compressed, will be 45 lbs. to the square inch, or 30 lbs. above the atmospheric pressure, and if you force 72 cubic feet of air into your vessel, the pressure will be 90 lbs., or 75 lbs. above the atmospheric pressure, &c. From this explanation it will be easy for you to calculate the power of the compressed air. The atmospheric air is one of those gases which do not condense into the liquid state under the heaviest pressure to which the same has been exposed.

H. F., of Bogota.—We do not think the Patent Office will allow a patent for your method of removing freckles from the skin, neither do we know of any one who would purchase it. You had better keep the secret until you are prepared to exhibit to our community the efficacy of your discovery. You might then dispose of it.

J. R. J., of Mass.—The pressure per square inch in a steam boiler is found by the following rule, when the weight, length of lever, diameter and weight of valve, are given : Multiply the number of pounds of the weight by the number expressing the proportion between the distance of the weight and that of the valve stem from the fulcrum, add the weight of lever, taken at the point where the weight is suspended and the weight of valve, all expressed in pounds, divide by the area of valve in square inches, and the result is the pressure of the steam in lbs. to the square inch.

R. S. L., of Ohio.—The quantity of water, in pounds, falling in one minute, multiplied into the perpendicular hight of your fall, and divided by 33,000, will give you its horse power, from which it is common to deduct one-third for friction leakage, &c. The water acts upon an overshot wheel by its gravity. If you multiply the area of your open pipe by the square root of its depth in feet, and by 200, it will give the cubic feet of water discharged per minute.

J. H. F., of Kansas.—If you wish to keep steam up in your boiler at a working pressure all night, to start your engine in the morning without kindling a fire, of course you must expect your boiler to wear out somewhat faster than otherwise. We prefer to use a damper in the smoke pipe so as to keep a low fire always under the boiler at night.

J. R. B., of N. J.—Dry loam or charcoal dust is superior to lime for spreading on the floor of a hen house. Old india-rubber shoes may be patched by the use of warm india-rubber cement, and patches of old rubber laid on and pressed down with a flat iron.

SPECIAL NOTICE—FOREIGN PATENT.—The population of Great Britain, is 30,000,000; of France, 35,000,000 ; Belgium, 5,000,000, Austria, 40,000,000; Prussia, 20,000,000; and Russia, 60,000,000. Patents may be secured by American citizens in all of these countries. Now is the time, while business is dull at home, to take advantage of these immense foreign fields. Mechanical improvements of all kinds are always in demand in Europe. There will never be a better time than the present to take patents abroad. We have reliable business connections with the principal capitals of Europe. Nearly all of the patents secured in foreign countries by Americans are obtained through our agency. Address Munn & Co., 37 Park row, New York. Circulars about foreign patents furnished free.

Money Received

At the Scientific American Office on account of Patent Office business, during one week preceding Wednesday, June 25, 1862 :—

M. C., of France, $15; J. B. W., of Mass., $25; W. J., of Wis., $15; E. J. C., of Ill., $30; J. A. A., of Conn., $25; J. F. T., of Mass., $25; R. A. G., of Wis., $50; L. B. F., of Mass., $15; O. L. B., of Mass., $15; T. & B., of N. Y., $30; G. & C., of Conn., $15; C. & P., of Mass., $25; E. S., of Mich., $20; A. T. P., of N. Y., $15; J. G. E., of Pa., $25; R. T. C., of Ill., $25; J. H., of N. J., $15; A. C. G., of N. Y., $15; A. J. H., of Pa., $35; W. H. R., of N. Y., $100; S. & H., of N. Y., $65; G. M. M., of Pa., $15; J. K., of N. Y., $15; C. L. G., of Conn., $25; R. R. G., of Ill., $15; H. H., of Mass., $30; A. J., of Conn., $15; W. M. D., of N. Y., $25; H. W., of N. J., $15; H. & F., of Conn., $25; R. K., of N. Y., $25; J. W. B., of N. Y., $15; P. D., of Minn., $10; G. W. H., of Ill., $10; H. N. H., of Vt., $25; S. B. W., of Ohio, $15; D. L , of Pa., $30; L. L., of Cal., $30, J. N. P., of N. Y., $15; W. H. F., of Mass., $25; H. S., of Pa., $10; S. E. P., of Mass., $15; P. & G., of N. Y., $15; A. & S., of Pa., $30; H. M., of Mass., $10; S. & P., of Ill., $15; E. F. B., of Mich., $20; C. G. A., of Mass., $15; M. R., of Mo., $15; A. R., of Iowa, $43; H. W., of Cal., $15; J. W. W., of Mich., $15; C. C. M., of N. Y., $25; L. F. D., of N. Y., $10; I. D. R., of N. Y., $40; W. S., of N. Y., $25; J. W. S., of N. Y., $25; P. A. S., of N. Y., $25; A. S., of N. Y., $25; D. L. B., of N. Y., $25; J. E. T., of N. Y., $25; W. P., of Md., $20; J. A. B., of Mass., $20; B. F. H., of N. H., $20; A. A. D., of N. J., $45; E. D. W., of N. Y., $22; B. B. B., of Nevada Ter., $10; J. L. McP., of Cal., $15; L. S. A., of N. Y., $20; G. E. H., of N. Y., $20; J. A. F., of Ohio, $20; N. C. S., of Conn., $20; D. H., of N. H., $45; J. C. M., of Ill., $20; J. A. W., of N. Y., $45.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office from June 18 to Wednesday, June 25, 1862 :—

J. E. T., of N. Y.; E. S., of Mich.; D. L. B., of N. Y.; R. T. C., of Ill.; J. G. E., of Pa.; A. S., of N. Y.; C. E. P., of Mo.; C. L. G., of Conn.; P. A. S., of N. Y.; A. I., of Pa.; E. J. C., of Ill.; W. J., of Wis.; J. F. T., of Mass.; J. A. A., of Conn.; J. B. W., of Mass.; G. & C., of Conn.; P. M., of France (2 cases); W. M. D., of N. Y.; J. W. S., of N. Y.; W. S., of N. Y.: A. R., of Iowa (2 cases); C. C. M., of N. Y.; H. & F., of Conn.; P. D., of Minn.; R. K., of N. Y.; E. F. B., of Mich.; H. N. H., of Vt.; G. W. H., of Ill.; E. D. W., of N. Y.; B. B. B., of Nevada Ter.; I. D. R., of N. Y.; T. E., of England; B. T. B. of N. Y.

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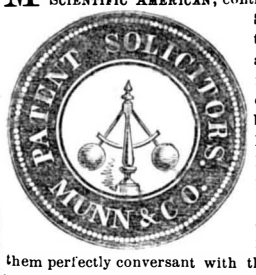

Consultation may be had with the firm between NINE and FOUR o'clock, daily, at their PRINCIPAL OFFICE, No. 37 PARK ROW, NEW YORK. We have also established a BRANCH OFFICE in the CITY OF WASHINGTON, on the CORNER OF F AND SEVENTH STREETS, opposite the United States Patent Office. This office is under the general superintendence of one of the firm, and is in daily communication with the Principal Office in New York, and personal attention will be given at the Patent Office to all such cases as may require it. Inventors and others who may visit Washington, having business at the Patent Offices are cordially invited to call at their office.

They are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business they have Offices at Nos. 66 Chancery Lane, London, 29 Boulevard, St. Martin, Paris, and 26 Rue des Eperonniers, Brussels. We think we may safely say that three-fourths of all the European Patents secured to American citizens are procured through our Agency.

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Immediately after the appointment of Mr. Holt to the office of Postmaster General of the United States, he addressed to us the subjoined very grateful testimonial:—

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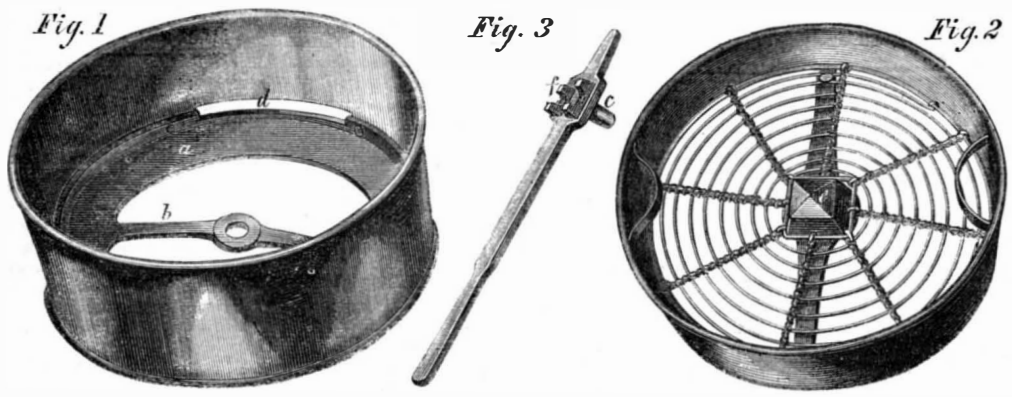
Improved Coal Sieve.

The handsome profits made on the sale of some patent coal sifters have stimulated inventors to extraordinary activity in this department, and the number of new patents which are being procured, and the ingenuity which is evinced in some of these devices are wonderful. The accompanying engravings illustrate a remarkably simple, convenient and durable coal sifter recently patented by W. B. Wadman, of Boston, Mass.

It consists of three parts which are represented separately in the engravings. Fig. 1 is the external



WADMAN'S COAL SIEVE.

barrel or cylinder, in which the sieve Fig. 2 fits loosely so that it may be shaken; Fig. 3, being the bar or handle for shaking the sieve.

The cylinder, Fig. 1 may be formed of sheet iron or wood, and fitted tightly in the top of an ordinary barrel to hold the ashes. Within the cylinder, and at its lower edge is a cast-iron rim, *a*, flaring downward toward the center to conduct the ashes to the middle of the barrel below. This rim may be of cast iron, and it is crossed by a bridge, *b*, which may be cast in one piece with it. This bridge has a hole through the middle to receive the pivot projection, *c*, Fig. 3, on the rod by which the sieve is shaken. The handle of this rod, when the parts are in place, passes through the slit, *d*, in the side of the cylinder, Fig. 1, and extends outward far enough to afford a convenient hold for the hand of the operator.

The sieve, Fig. 2, is formed of sheet iron or other suitable metal, and its bottom is covered with a meshwork of iron wire. It is crossed at the bottom by a bar, which has a square projection, *e*, upon its middle. This projection is hollow below to fit upon a corresponding projection, *f*, upon the upper side of the rod, Fig. 3. So that when a reciprocating movement is given to the handle of this rod along the slit, *d*, a corresponding motion is imparted to the sieve.

The sieve is provided with handles upon its inner side, and the whole is closed by a tight cover not shown in the engravings. The projection, *f*, is cut out in the form shown to diminish the weight of metal.

The patent for this invention was granted through the Scientific American Patent Agency, and further information in relation to it may be obtained by addressing the inventor, W. B. Wadman, at 1013 Washington street, Boston, Mass.

Improved Endless Revolving Mattress.

The accompanying engravings illustrate a simple but very novel improvement in mattresses which promises to be of considerable value. It consists merely in making the mattress in the form of an endless belt, as shown in perspective in Fig. 1, and in section in Fig. 2.

The principal object of this invention is to prevent the mattress from becoming compressed and flattened in some portions more than in others; this unequal compression producing an uneven, hard and uncomfortable surface for the sleeper. By having the mattress folded as shown it is very easy, as the bed is made each day, to roll the mattress so as to bring the fold in a new place, and thus to change all parts of the mattress in their positions in relation to each other and to the bed. This of course prevents any one place from becoming compressed more than another, and preserves all parts in an even, smooth and comfortable condition.

Beside this principal advantage the following are claimed as incidental :—

In consequence of the surface being frequently changed this mattress will last much longer than an ordinary one.

Being folded in a different placeevery time the surface is changed, has a tendency to loosen up the filling and keep the bed constantly soft and elastic.

Being made of two thicknesses, each thickness about half that of an ordinary mattress, it can be more thoroughly aired and therefore is more conducive to health than other mattresses.

The fact that it can be used so great a length of time, without picking over and refilling makes it very durable.

When the ticking is soiled or worn on one side, the mattress can be turned so as to bring the other side out.

The patent for this invention was granted, through the Scientific American Patent Agency, April 15, 1862, and further information in relation to it may be obtained by addressing the inventor, Edward F. Bassett, at Seymour, Conn.

Fig. 1.

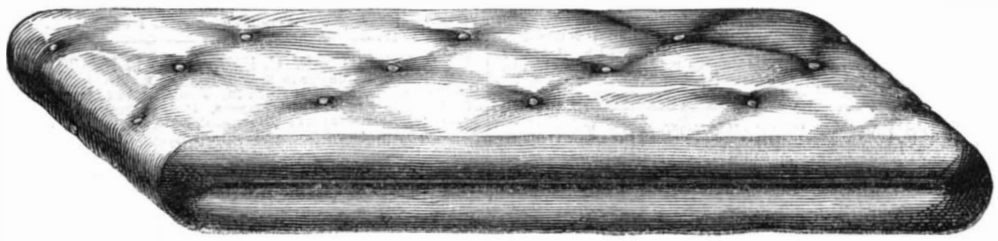
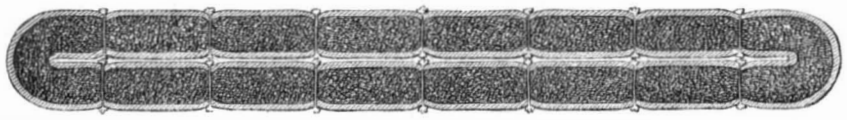


Fig. 2.



BASSETT'S ENDLESS REVOLVING MATTRESS.

A LARGE pelican was lately shot at Carson Sink on the eastern slope of the Serra Nevada. It measured 8 feet 7 inches from tip to tip of the wings. It was milk white except the quill feathers in the wings, which were black.

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